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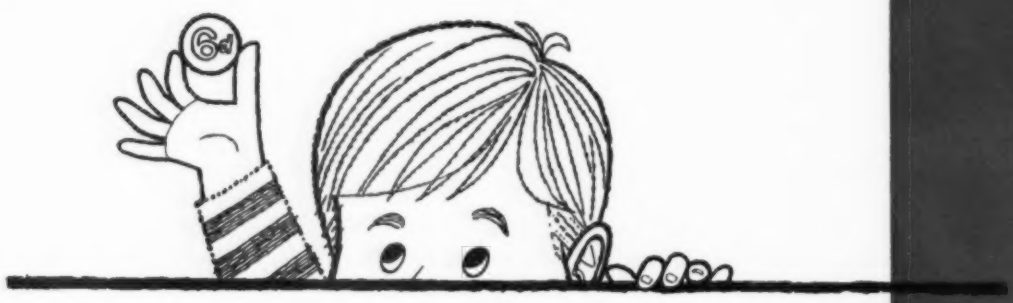

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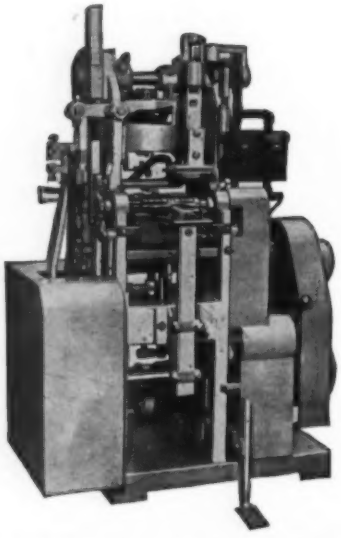

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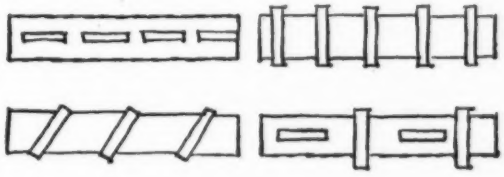
Lighting-2

The general principles of factory lighting have been dealt with in the previous data sheet (No. 6). This one considers briefly certain factors—not always fully appreciated — that influence the lighting for some particular factory applications. The next data sheet will carry the subject further.

Work benches

The most universal application of lighting is to bench work, for there is no branch of manufacturing that does not have its work benches which, of necessity, are used for a great variety of occupations. No single lighting method is suitable for all cases.

The introduction of fluorescent lighting has gone a long way to solving one of the main problems here; for while the high degree of brightness of filament lamps tends to preclude their use for individual lighting owing to the glare, the fluorescent tube with its greater expanse of light source has made localised lighting with a low mounting height more practicable. Moreover, the length of the fluorescent tube puts into the hands of the designer a means of controlling shadows which, together with glare, probably represent the most prolific causes of errors and eye-strain.



With narrow individual benches (not more than 4 ft. wide), there are four basic methods of localised lighting: longitudinal, transverse, diagonal or a combination of longitudinal and transverse. With wider benches it is not advisable to use fittings directly over benches, and fittings should be behind the workers at each edge of the bench. Where particularly high illumination is required, fluorescent fittings may be mounted as local lights—low enough for the skirt of the reflector to conceal the lamps from the eye of the operator.

It is good practice to use reflectors which allow a reasonable amount of light to spill upwards, giving a certain amount of general lighting.

High-bay shops

Probably the most difficult of all factory lighting problems is that of high-bay lighting. In lofty, long and sometimes necessarily dirty shops such as those which house really large machine tools and overhead cranes, which do their worst to defy the efforts of the illuminating engineer, it requires great ingenuity, coupled frequently with high lamp wattage, to provide the workman with enough light to allow him to do his job efficiently. From the planer operator to the slinger, the workman, though he may not know it, is dependent on good lighting if he is to avoid an over-cut or a serious crane mishap.

The major problems associated with the lighting of high and relatively narrow shops, such as heavy machine shops and foundries, are:—

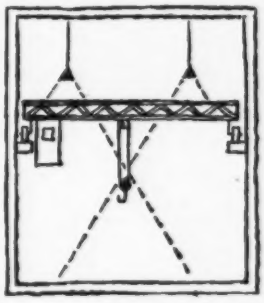
(a) Poor light utilisation caused by excessive light absorption by the large and often dark wall area.

(b) Preponderance of light flux downwards and poor cross lighting causing poor illumination on vertical surfaces, and heavy shadows.

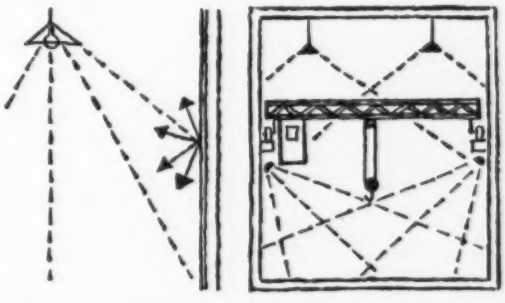
(c) Possibility of heavy light absorption in the atmosphere.

(d) Difficulty of access to high fittings for maintenance.

In high-bay workshops there is a tendency to use concentrating fittings so that the maximum proportion of the light output reaches the working area without spread to the walls, but the saving in wall absorption is obtained only by accepting a depressing environment, poor cross lighting and heavy shadows.



In many cases it is good practice to accept the inevitable reduction in light utilisation by wall absorption and to reduce this by applying light colours to interior surfaces where possible throughout. This approach results in more cheerful conditions and provides equally good illumination values and better cross lighting. Even better is to add angled lighting from the sides below crane level.



In the conditions obtaining in this type of shop, rapid deterioration in light source intensity due to dust must be expected. Facilities should always be provided for easy access to fittings for cleaning and maintenance.

For further information, get in touch with your Electricity Board or write direct to the Electrical Development Association, 2 Savoy Hill, London, W.C.2. Telephone: TEMple Bar 9434.

Excellent reference books on electricity and productivity (8/6 each, or 9/- post free) are available—"Lighting in Industry" is an example.

E.D.A. also have available on free loan in the United Kingdom a series of films on the industrial uses of electricity, including one on industrial lighting. Ask for a catalogue.

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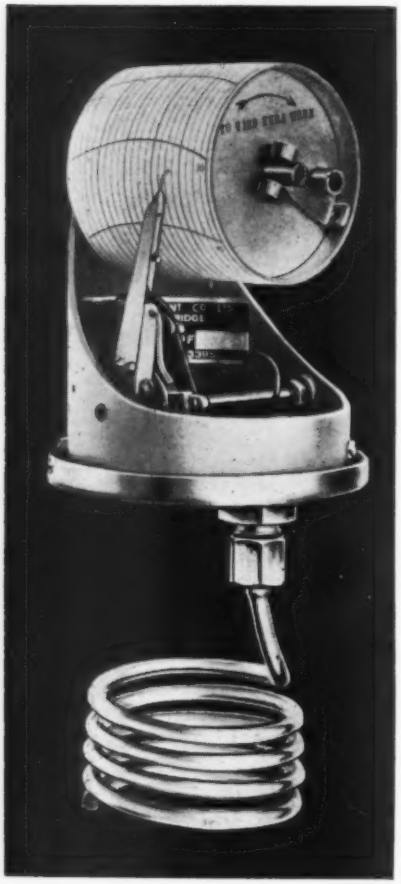

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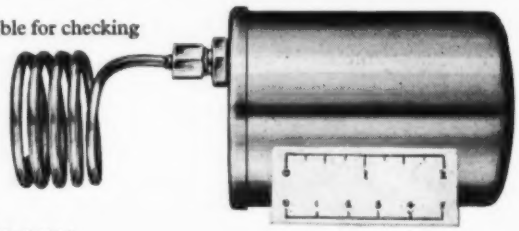

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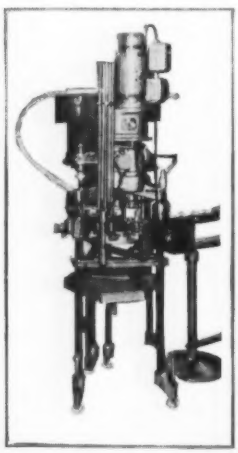

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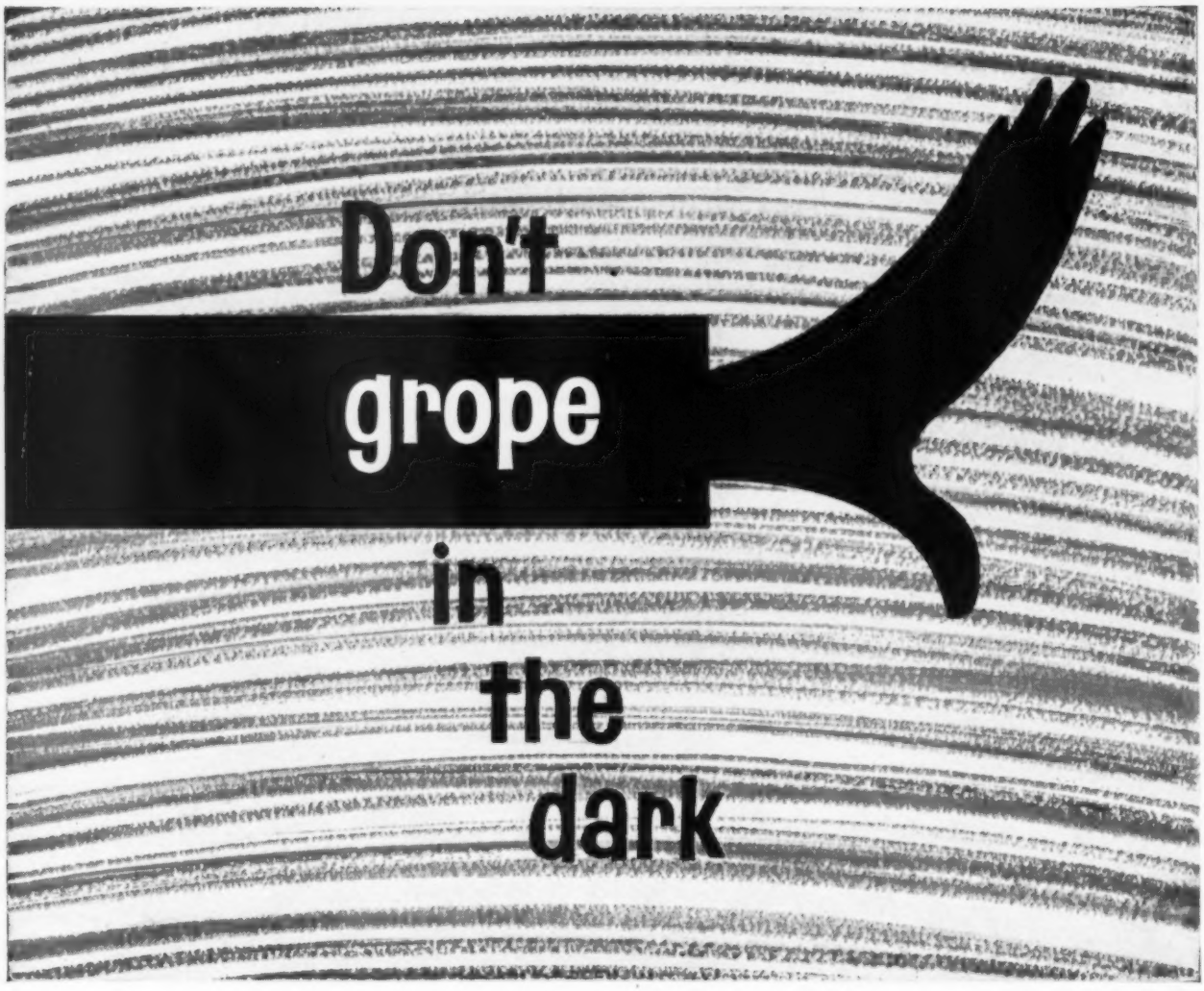

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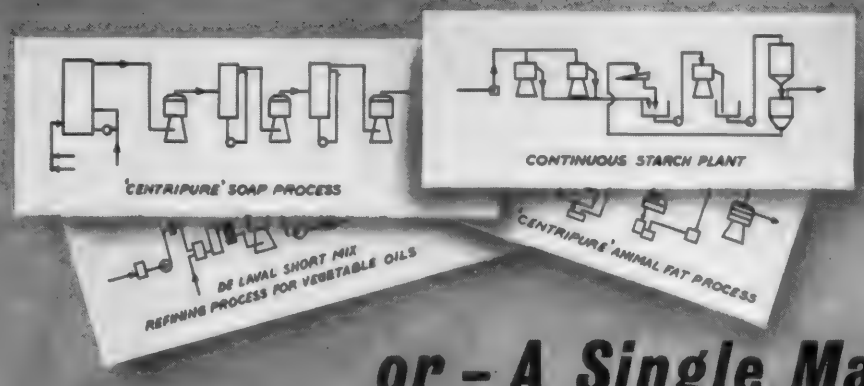

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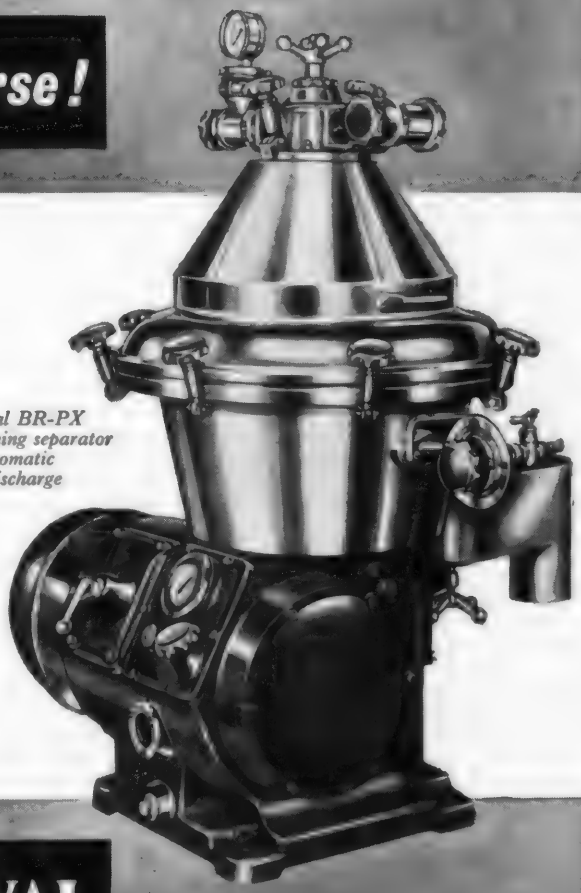

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Butterfield Road Tanks
supplied to many leading Food Distributors
are insulated as required to maintain
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Fabricated in Stainless Steel, Mild Steel (suitably
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in safe, economical transport for
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Illustrated above
1,500 gallon single compartment Road Tank fabricated of $\frac{3}{16}$" thick Aluminium. Mounted on four cradles incorporating Silent-bloc bushes. Insulated with 2" thick Fibreglass, covered with 18 gauge Aluminium sheets. Mounted on Bedford 7-ton chassis.

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2,400 gallon Liquid Chocolate Transport Tank, fabricated from 18 8 Ti Stainless Steel. The tank shell and ends are covered with electric heating blankets and encased in 4" thick fibreglass insulation, with an outer casing of 18 gauge aluminium sheets. The 3" outlet cock is also fitted with a heating blanket. The tank is designed for pressure discharge at 25 lbs. p.s.i. and tested to 50 lbs. p.s.i. Mounted on Leyland Octopus

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Needle Applicators for measuring in sausages, etc.

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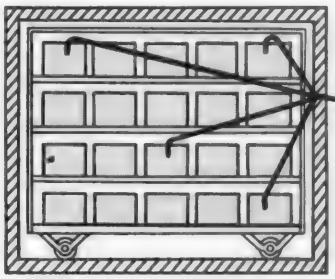

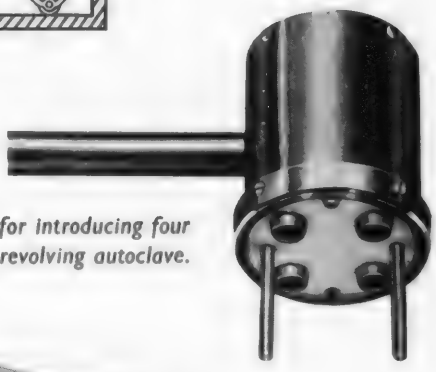

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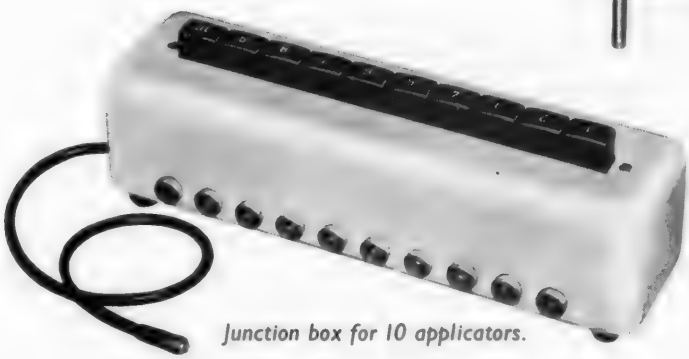

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PATTY SIZES AND SHAPES
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Equipped with a $\frac{3}{4}$ h.p. Capacity type, single phase, 60 cycle motor, in either 110 or 220 volt models. Three phase, direct current, 50 or 25 cycle motors can be supplied at additional cost.

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The Hollymatic is 26$\frac{3}{4}$" long x 18$\frac{1}{2}$" wide by 27$\frac{1}{2}$" high.

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The Hollymatic weighs 180 lbs. complete.

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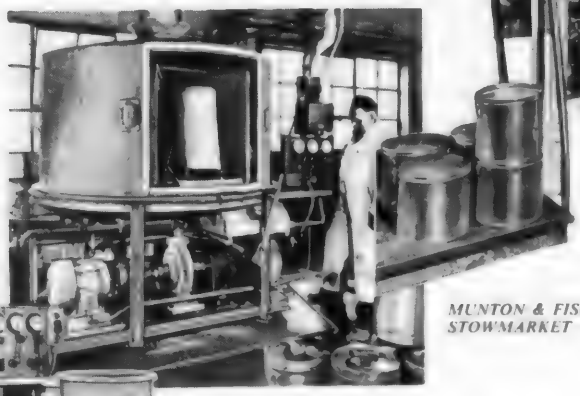

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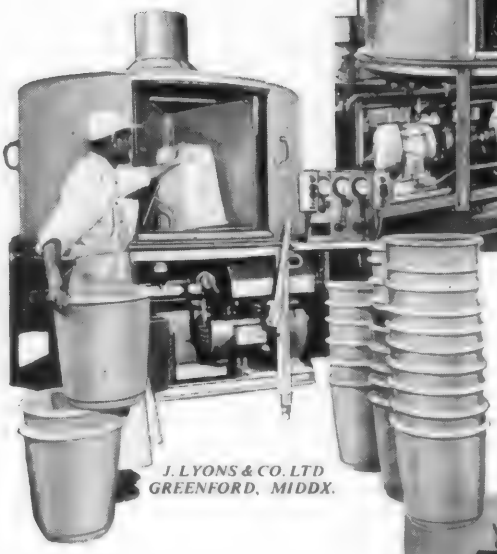

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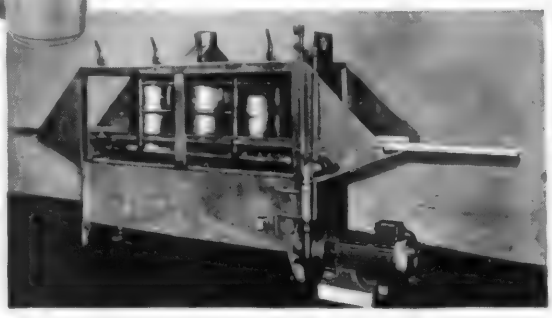

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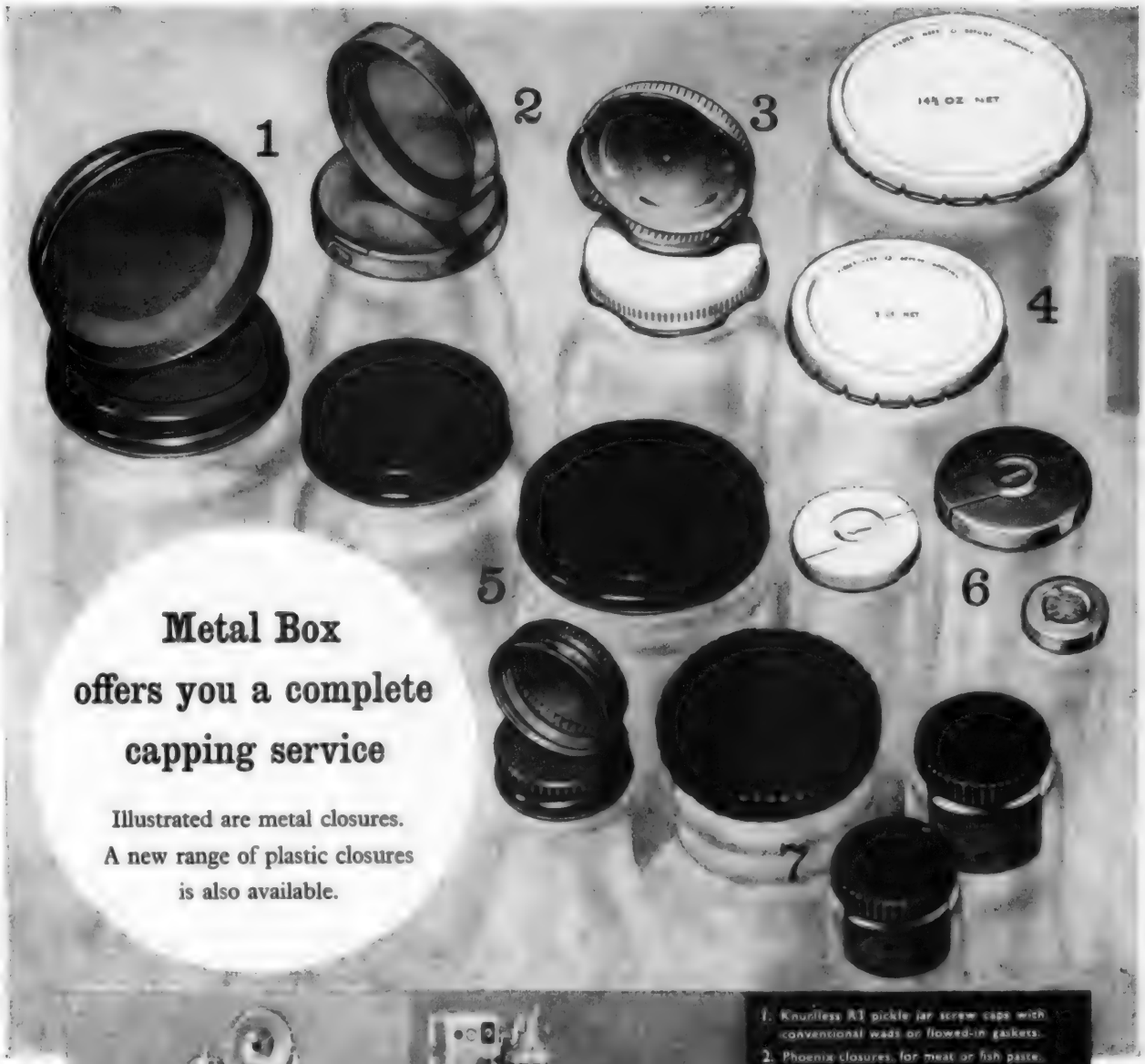

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Illustrated are metal closures.
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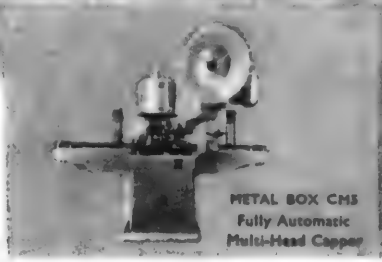

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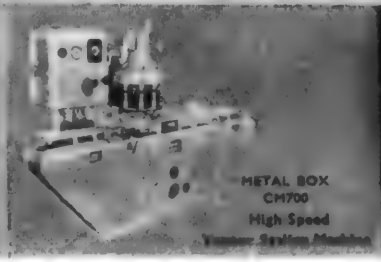

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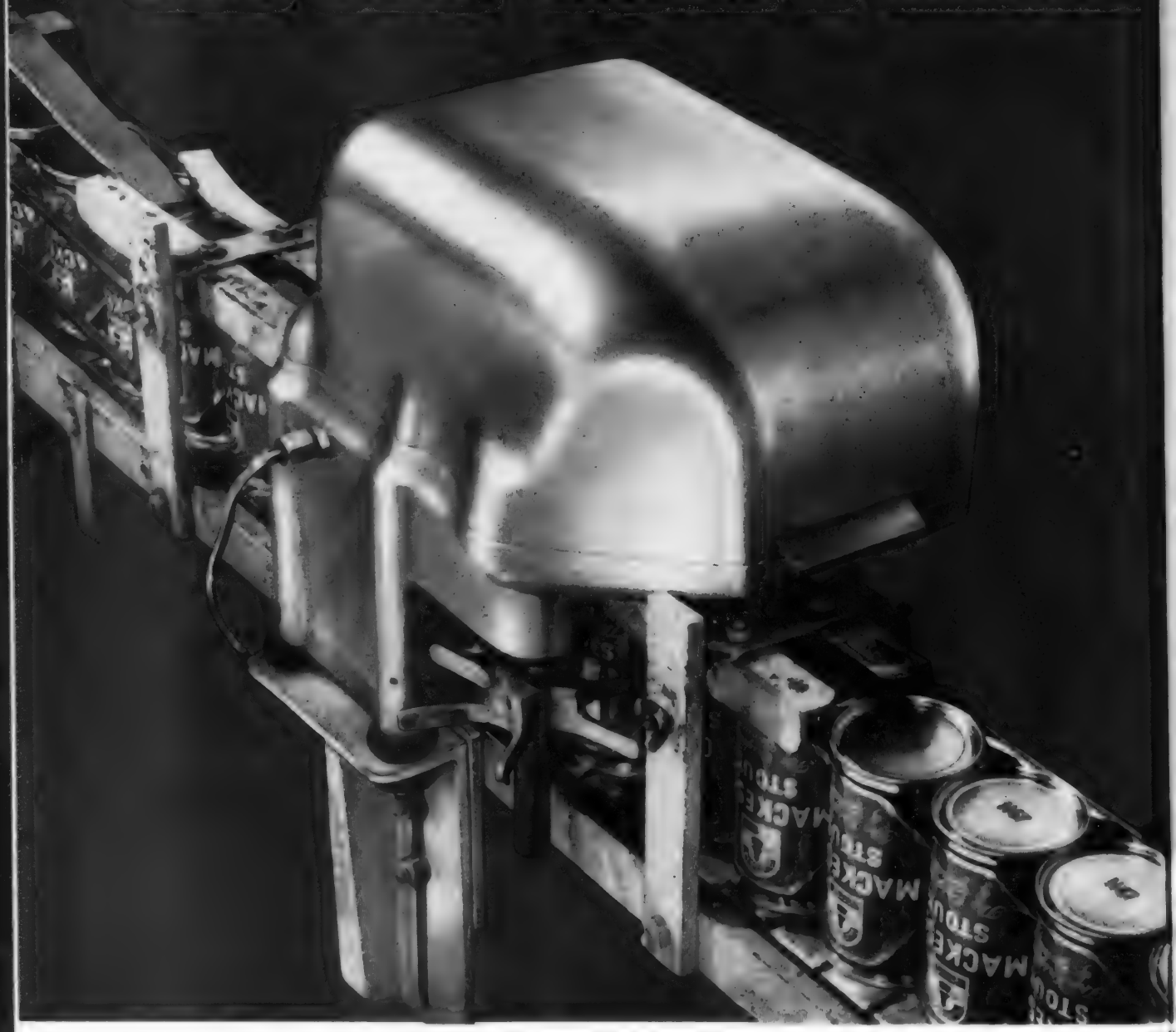

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Bottles sta

My dear, you'd never *dream* what trouble I've had with Roderick lately. He's had bottles on the brain. No, dear, *brain* — not train. One night he sat bolt upright in bed and chanted (positively chanted):— *Bottles stand on their caps.* Just like that. Then a lot of rigmarole about juice all over his factory floor. Sticky situation. Send for Production Manager. Send for Foreman. My dear, I was nearly sending for a Harley Street headshrinker, by that time. Oh, he's all right now. Something called United Glass. No, not a wonder-drug, darling. They make both bottles *and* caps. Closures, Roderick calls them. *Closures*, not roses, dear. Roderick says the cap always fits when you buy bottles from United Glass. And as I say to Roderick, if the cap fits, wear it . . .

United Glass is the only British maker of bottles with its own closure division. And it's the only company with as many as eight bottle factories. They supply bottles to thousands of customers for a wide range of products. The Glass Packaging Advisory Bureau, set up by United Glass, will be glad to advise you on all your glass packaging problems. Please get in touch.

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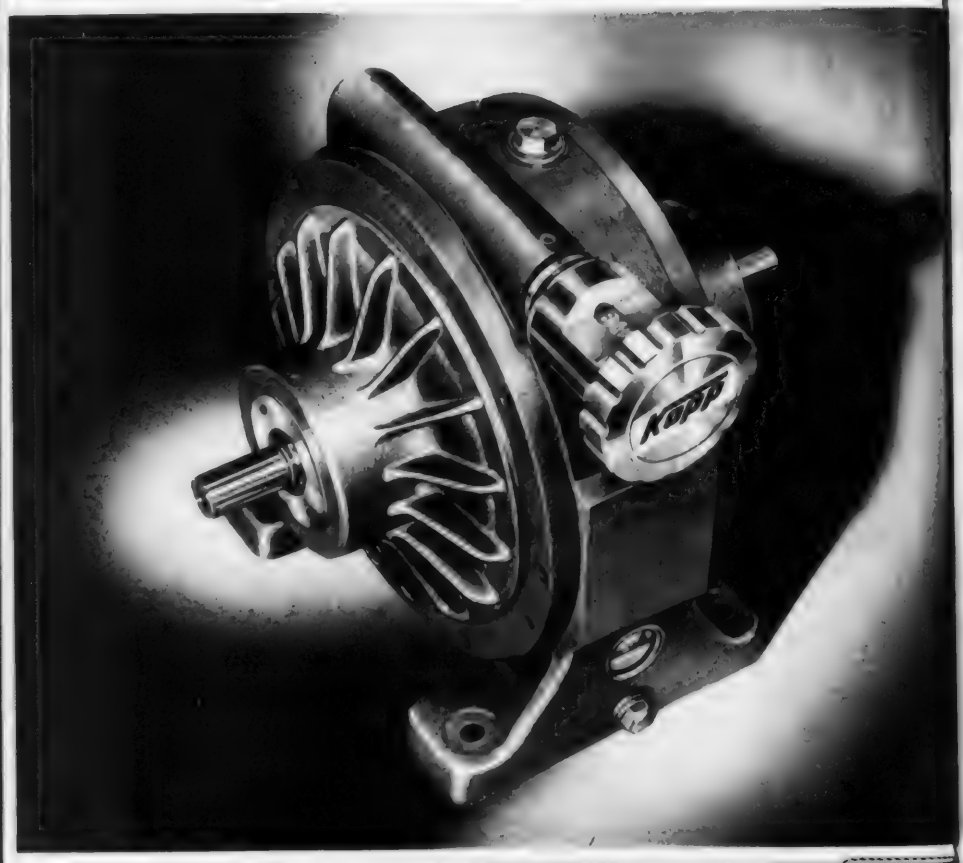

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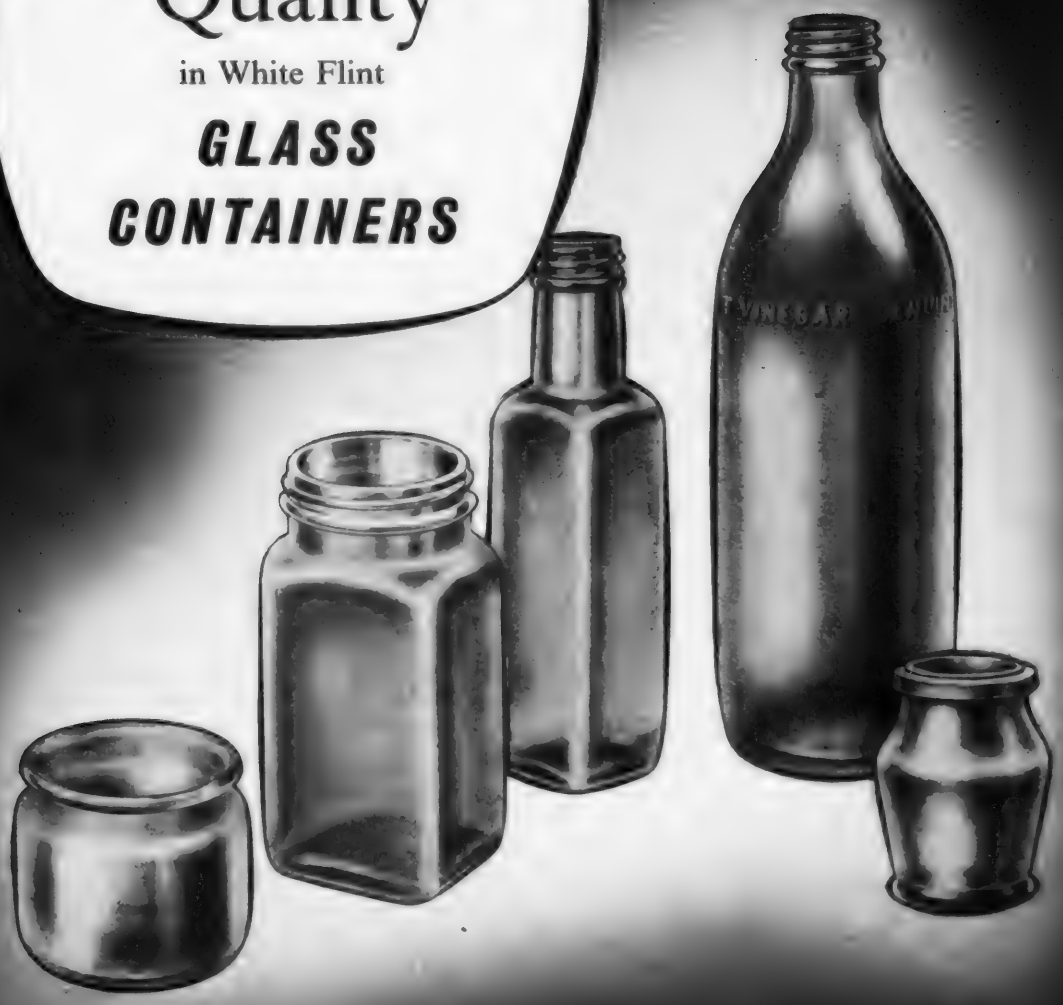

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[C]

Intense heat source, flexible simple adjustment, no fumes to "taste" the cooking oil.

"As a result we chose town gas, which is the only fuel which will meet all these requirements".

Fig. 1
View of gas-heated cooking vat at Smiths Crisps Paulsgrove factory in Portsmouth. Cutting and crinkling machine on right feeding the oil into the vat. Cooked crisps emerging on conveyor shown in foreground.

FUEL SELECTION FOR THE FOOD PROCESSING INDUSTRY

In many food processing industries there is a demand for a heating means which meets the following requirements:

(*a*) Availability at required localised intensity.

(*b*) Instantaneous adjustment of the fuel supply in accordance with variations in the temperature or humidity of the atmosphere, and the quality of the raw material.

(*c*) The absence of any fumes which are likely to impair the taste of the product.

The manufacture of potato crisps is a particular case in point. For example, a typical raw potato might contain 79.2% of moisture and 6.6 milligrams per ounce of vitamin "C". After processing the potatoes to form crisps the moisture content is reduced to about 5% and the vitamin content is maintained. By comparison it should be noted that the following per cent. losses of vitamin "C" occur when potatoes are treated in the following manner:

1. Boiled in their skins (15%)
2. Baked in their skins (20%)
3. Fried (30%)
4. Boiled after peeling (50%)

In other words, the process of converting potatoes into crisps is a precise problem in chemical process engineering.

One of the most modern of the 17 factories now being operated by Smiths Potato Crisps Limited is in Southampton Road, Paulsgrove, Portsmouth. The factory deals with about 22-25 tons of potatoes per day, producing some 14,000 tins of crisps (containing 18 packets per tin) each day on a full day and evening shift basis.

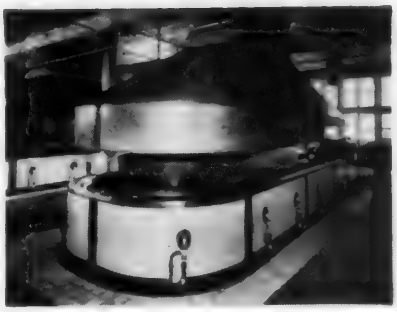
The potatoes are first washed thoroughly in automatic machines and skips of washed potatoes passed to the upper floor of the building where six cooking vats are located. At the end of each unit are the crisp cutters, consisting of a fluted phosphor-bronze cutting disc fitted with knives and designed such that they produce a corrugated thin potato slice; the corrugation ensuring that surplus starch drains away quickly, and in addition a greater cooking surface is presented to the oil which shortens the cooking operation.

The physical problem of potato crisp manufacture is its essentially seasonal nature, so that the plant is designed on a unit basis complete with its team of operatives from the potato feed to the ultimate packing into tins.

The cooking vat consists of an oval continuous channel of overall length about 30 ft. Groundnut oil is fed into the unit from a tank, the frying unit holding about 200 gallons. At one end a paddle wheel circulates the oil continuously around the oval path and the starch free corrugated raw potatoes are fed in at one side of the oval, and by the time they have completed the circuit they are ready to be scooped out on to a moving conveyor which takes them to the packing department. Four gas burners are arranged on either side of the cooking vat and a gas/air mixture impinges upon ground firebrick, giving an almost white hot furnace bed. The gas burners are adjustable, and it is arranged that the initial hot oil zone is maintained at a high temperature; the other burner adjustments being such that there is a gradual drop in temperature from the hot zone to the point where the crisps are finally removed. Temperature control throughout the cooking vats is maintained from an industrial thermometer, the bulb of which measures the temperature of the hot zone, and if this rises unduly movement of a lever enables cold oil to be added to decrease the temperature, after which burner adjustments can be made instantaneously. Air agitators also separate the crisps during the cooking process. The oil temperature is so arranged that the majority of the moisture from the crisps is removed by the time they have passed about three-quarters of the way around the oval circuit.

It is important that there should be no noxious fumes passed into the atmosphere so that the fat and combustion products, before escape to the atmosphere, pass through an Ozonair plant producing 18,000 cu. ft. of ozone per hour, after which the fumes pass through an air filter. The filter is cleaned with cleansing fluid during the nightly shut down, the extraction system dealing with about 2,000,000 cu. ft. of air per hour.

The cooked crisps are now passed on a conveyor to the weighing and packing department located on the lower floor. As they pass along a vibrating conveyor above the weighing machines, four gates divert the



• Fig. 2. The gas-heated cooking vat showing air and town gas supplies to bottom furnace.

• Fig. 3. Automatic weighing machines feeding Smiths Crisps into Glassine bags.

• Fig. 4. The Holmes B-M Gas Meter with a capacity of 30,000 cu. ft. of gas per hour.

crisps to the special "Fluidflow" automatic weighing and filling machines which can deal with 22 packets per minute. The crisps collect in the hopper above the filling machine and a quantity of crisps passes on to the weighing scale. When the correct amount is present, the flow from the hopper is momentarily interrupted and a jet of air pushes the crisps into the Glassine bags. It is at this stage the small paper twists of salt are added—for this purpose a separate glass walled room is provided which houses a number of high speed machines which have been designed and manufactured by the Smiths Company to fill salt packets at the rate of 120 per minute. After the salt addition the packets are sealed.

It is interesting to note that the total time elapsing from the cutting of the potato to its automatic packing is less than 10 minutes, and during the whole of this period the potatoes themselves are not handled by human beings.

The sealed bags pass on another conveyor to operatives who fill tins with 18 packets, after which they are labelled and sent to the despatch department.

The tin cleaning machine ensures that each returned tin is first rinsed with a chemical cleaner and then with hot water to remove the old label, after which it is taken on the conveyor to an overhead drying oven which heats it to 350°F., thus ensuring that when the tins pass on the same conveyor to the packing department they are completely sterilized.

The Manager of the Paulsgrove factory, Mr. A. F. S. Cusack, received his 25 years long-service award from the company in 1954—so that he has spent with this fabulous company nearly 30 of its 40 odd years of existence. In this period its small factory at Cricklewood has increased to 17 production units with 9 distribution departments, in addition to factories in Australia and Holland.

When Mr. Frank Smith died at the age of 81 in 1956 the firm was producing between 11-12 million packets of crisps per week and was employing 4,000 people. His deputy, Mr. C. J. Scott, then took over and he is targeting for one packet of Smiths Crisps per person per week, instead of the present approximate consumption of one in four!

Mr. Cusack was approached on the question of fuel selection and he outlined his requirements, namely, that he must have a heat source which was intense, flexible and capable of simple adjustment to meet changes in the ambient temperature and the large variation of the moisture content of potatoes from batch to batch. The fuel must generate no fumes which would contaminate the food product or tend to "taste" the cooking oil. He said: "As a result we chose the only fuel which will meet all these requirements". Each of the six units consumes 6 thousand cubic feet of town gas per hour from the Southern Gas Board, and again Mr. Cusack pointed out how the Southern Gas Board had at all times done their very best to collaborate with his company during their installation problems.

At the outset it was mentioned that the raw potato contains on an average 79.2% of moisture; in addition it contains 6.6 milligrams per ounce of vitamin "C" which, calculated on dry, fat free potatoes amounts to 31 milligrams. The crisps when cooked contains only 5% of moisture and maintain the vitamin "C" content almost unimpaired.

A typical analysis of a potato crisp is: protein 5.6%, oil 38.4%, ash 2.4%, water 5.4%, carbo-hydrate 48.2%, vitamin "C" 15 mgms. per ounce.

During World War II, the late Sir Jack Drummond, Scientific Adviser to the Ministry of Food, stated that he was surprised at the analysis of Smiths Potato Crisps, for he had ". . . rather expected to find the nutritive value was considerably reduced by the caramelisation caused by crisping. In actual fact, they have a high calorific value . . . and are readily digestible . . ." As a result Smiths Crisps became an "off-points" food and as such were in unprecedented demand.

Obviously, Smiths must not depend entirely upon potatoes from the market, and in 1936 they bought a farm in Lincolnshire which now embraces some 8,000 acres.

The Smith enterprise is that of a man in his middle 40's who believed in his hunch when others thought him unwise. His hunch paid off, until now his company's shares are looked on as "blue chips" on the Stock Exchange. This is just one of some 4,000 trades, professions and occupations which are served by the Gas Industry in free competition with all other fuels.

Smiths Potato Crisps, a well-known, well-established national product, is one of many others in which the constant research and development conducted by the Gas Industry Research Laboratories help towards high economic outputs with the simplest of costing devices—namely, the gas meter—and not necessitating wasted solid fuel storage space or deliveries of any kind but being piped to the point of use at constant calorific value.

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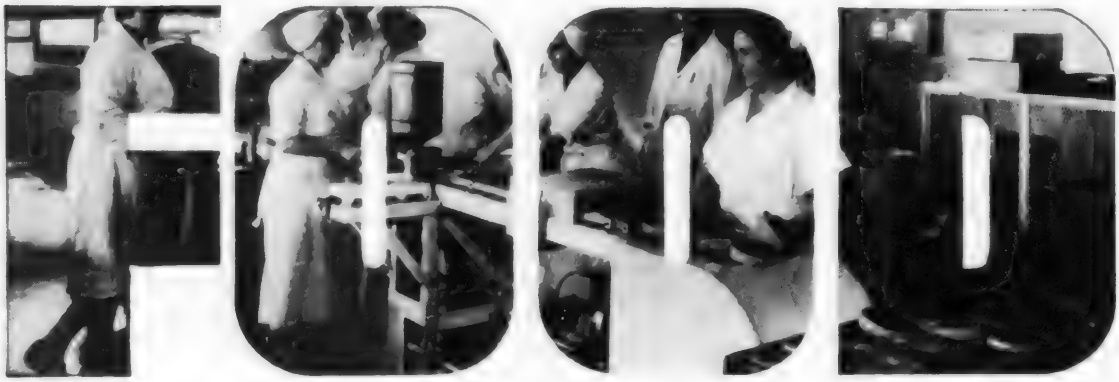
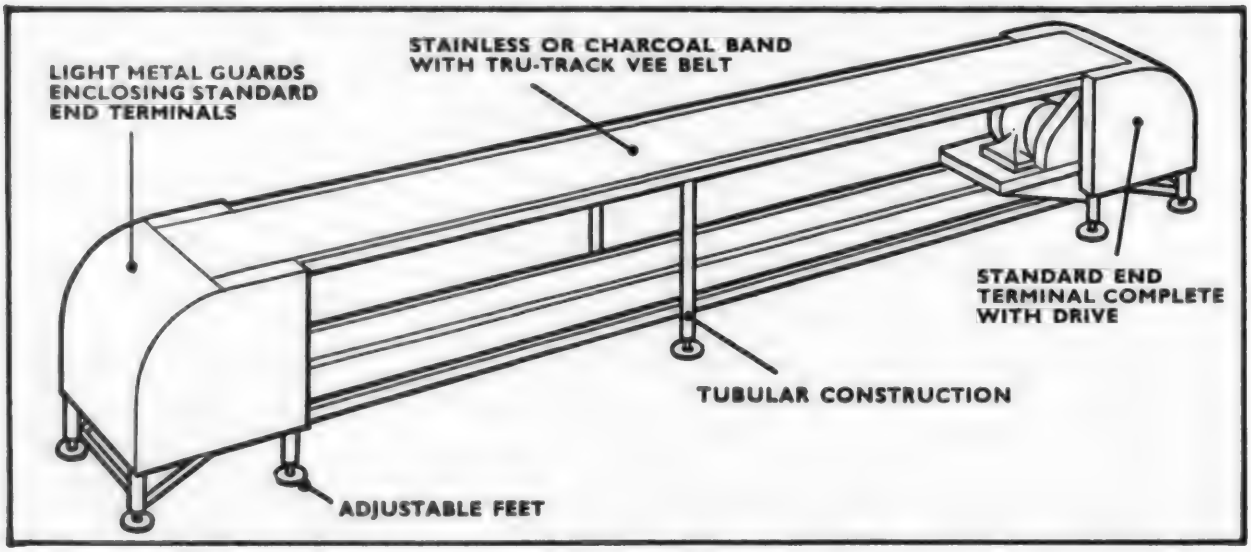


need NOT be an Expensive Proposition


LIGHT METAL GUARDS ENCLOSING STANDARD END TERMINALS
STAINLESS OR CHARCOAL BAND WITH TRU-TRACK VEE BELT
STANDARD END TERMINAL COMPLETE WITH DRIVE
TUBULAR CONSTRUCTION
ADJUSTABLE FEET

with STANDARDISED TRU-TRACK CONVEYORS

This photograph shows a typical installation of a conveyor for preparing hams in a food factory

Sandvik Stainless Steel Band Conveyors have been specially designed to provide the most hygienic method of handling foodstuffs. They are supplied in band widths from 4 to 32 inches and have a hard smooth surface which has already proved its efficiency with many well-known manufacturers.

The Tru-Track feature ensures constant band tracking with minimum clearances of conveyor structure, which is built up of standard tubular sections to provide a perfect dust-free unit capable of being extended or shortened as desired. You will be surprised at the relatively low cost of these standardised conveyors, further details of which, complete with specification, will be supplied on application

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Standard 500 gallon F.M.B. quality vertical storage tank.

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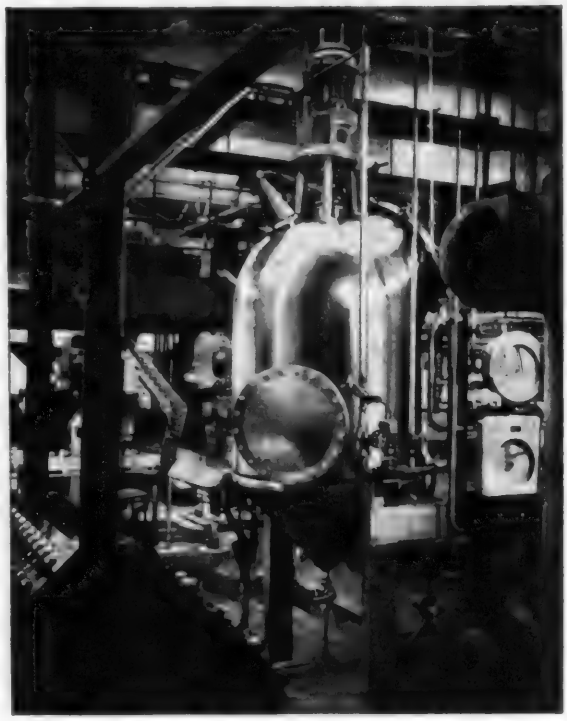

500 gallon pressure reaction agitator. F.M.B. quality. Polished inside and out. By courtesy of Messrs. Van den Berghs & Jurgens Ltd.

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HYGIENIC
INTERSTACKING
LIGHTWEIGHT
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(Above) P.I.
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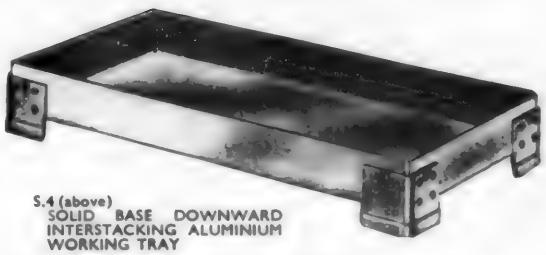

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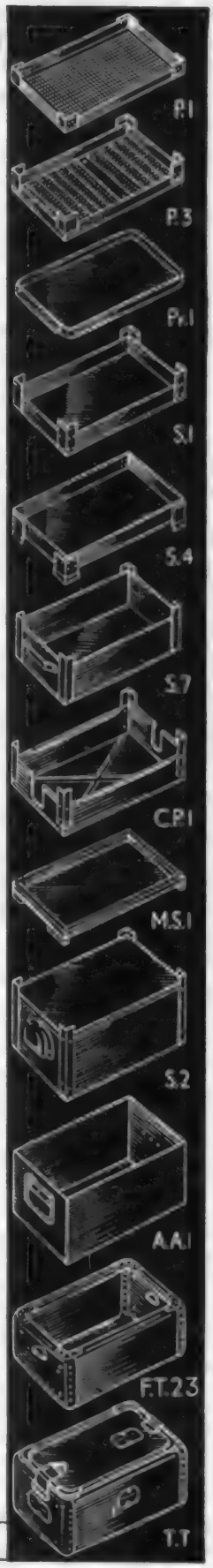

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Introducing the

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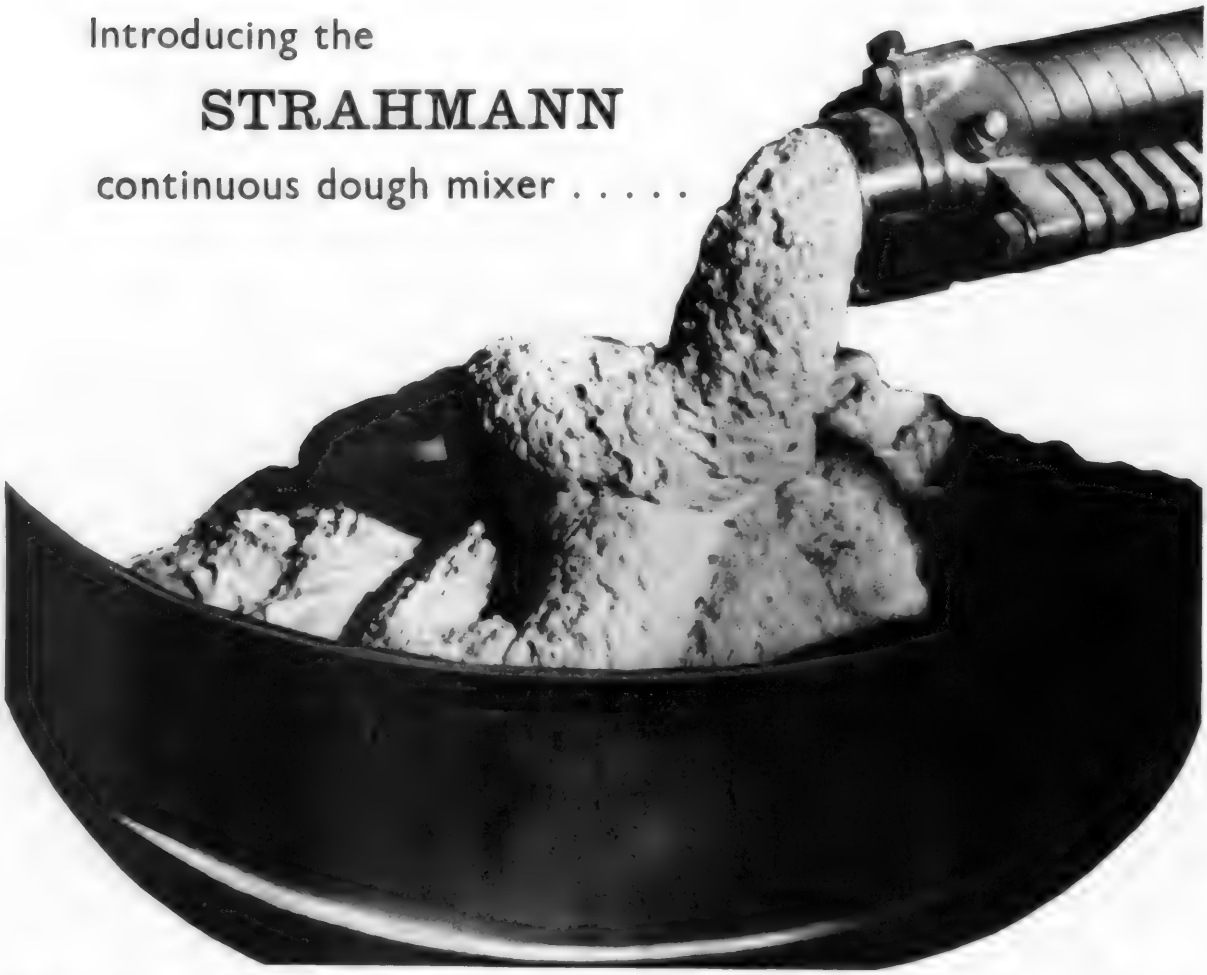
continuous dough mixer . . . . .



The Strahmann Mixer, supplying the requirements of any plant up to nine-sack capacity, produces a continuous stream of completely homogeneous gas-free dough. Using a normal bakers' grade of flour from 5% to 10% more water has been added successfully. **It offers you:- Higher yield Reduction or elimination of bulk fermentation Complete mechanisation in mixing · Automatic consistency control.**

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Stainless steel vessel with mild steel jacket

12,000 gallon water separator

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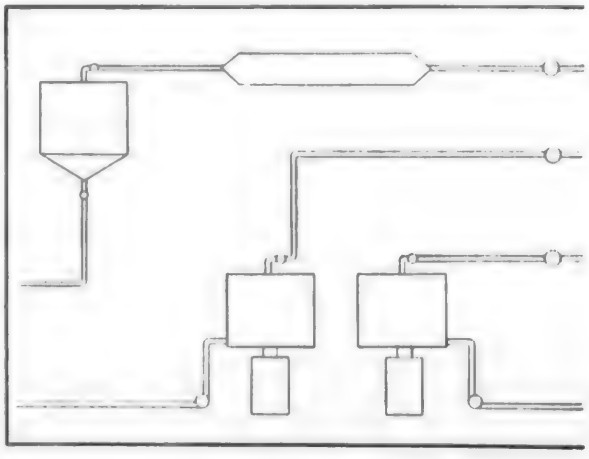
PRODUCTIVITY CALLS

FIRST YOUR FORMULA. It was born in your laboratory out of hard thinking, patient work and hopeful spending. Now it is ready to be turned into productivity and profits. Now speed comes into the picture; speed and volume. It's going to be thousands of gallons now, not pipettes full. Yet it has all got to be as precise in the factory as it was in the laboratory. Clearly a matter of measured batch dispensing and blending; a problem of process control.

THE AGE OF AUTOMATION

This was the picture we at Measurement had in our mind's eye when we were working on the Measurement *Automatic* Liquid Process Control system. Industry, we knew, would want accuracy and speed, and a modern way of applying it. An up-to-the-minute way. In this modern age the bucket is out, mainly because it excludes accuracy. Lifting and trucking must be eliminated because firstly it results in hold-ups, secondly in a waste of labour, and thirdly fatigue with its resulting fall-off in rate of production. Our equipment aims at automatically dispensing the right quantity to the right place at the right time, with all the necessary indication and records made automatically en route. The age of automation inspires sound business men to ask for the right installation for the job and no making shift. Control is the keyword.

"Backed by our years of experience", as the advertisements say (for we have been making liquid meters, pumps and electrical control apparatus for a very long time), we set about meeting this challenge. Years of research finally produced



the instrumentation that offered the flexibility which is essential, and the standardisation which makes the system an economic proposition for industry.

A FLEXIBLE SYSTEM

Today Measurement equipment is used in handling a large number of liquids in food manufacture, paper making, oil blending and chemical mixing processes. Liquids handled range from condensed milk to caustic liquors, and from benzine to beef dripping, and at Measurement Limited there is a catch phrase, "If it flows in a pipeline, then we can meter it".

ADVISORY SERVICE

We offer advice, designs and drawings to cover any complete liquid handling installation to suit any process—*your* own particular process. Given dimensional details, components can be supplied to be fitted into existing panels; otherwise we would supply complete wall-mounted or bench-mounted panels, or console models, tested and ready for installation. Servicing is a thing we regard as a duty at Measurement.

PUNCHED CARD SYSTEM

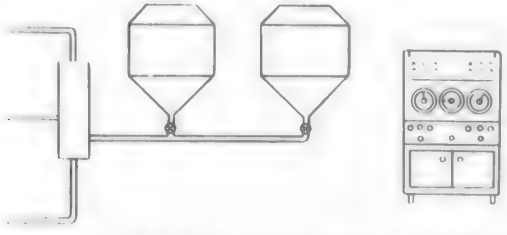
Not only does the Measurement system make Liquid Process Control merely a matter of pressing buttons, now batch delivery and blending can be completely preset and controlled by the punched card system!

SCRIBBANS-KEMP (BAKERIES) LIMITED
Control panel for automatic blending of liquids used in biscuit manufacture at the factory of Scribbans-Kemp (Bakeries) Limited, Grimsby.

FOR MEASUREMENT LIMITED

A WIDE RANGE OF INSTRUMENTS

Whenever a liquid has to be handled, Measurement Limited make equipment to do the job, from indicating a total consumption of a liquid to the automatic dispensing, blending and mixing of various liquids.



Automatic dispensing of liquid from alternative storage tanks to a blending tank and to two rotary mixing machines. The three meters are denoted thus —○, and the three indicators are remotely mounted in a control panel with signal lamps to confirm operation of meters, valves and pumps.

The range of products include:—

(a) Meters made in various metals and moulded materials to enable almost any particle-free liquid to be metered.
(b) Meters with small pointer type indices.
(c) Meters with small direct reading counters.
(d) Meters with resettable direct reading numeral rollers.
(e) Meters with remote reading magnetic counters.
(f) Meters with horizontal or vertical large dial instruments having resettable pointers.
(g) Meters with automatic presettable indicators that enable the operation of valves, pumps and warning devices.
(h) Complete panels with auto preset indicators, signal lamps and push buttons for wall mounting or free standing.
(i) Schemes involving a number of meters dispensing liquids to one outlet.
(j) Schemes where a number of liquids are dispensed through one meter.
(k) Automatic actuation of metering equipment by photo-electric cell or contact operating devices.
(l) Complete panels incorporating mimic diagrams.
(m) Complete auto preset equipment that could be preset by a punched card reader unit.

★ *You may be tempted to tear out this advertisement for reference. Well, it's always a pity to spoil a book: get your Secretary to drop us a card and we'll gladly send you a reprint of these pages. A letter with more detailed requests will, of course, receive more detailed attention. Write to:—*

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puts TIME on your side

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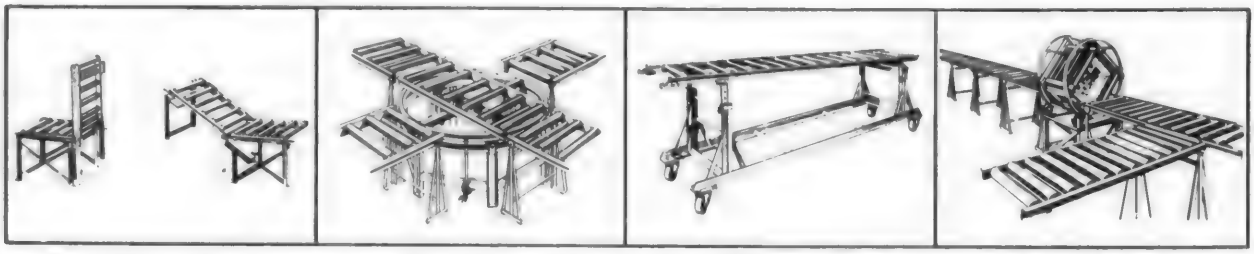

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Low Cost—Send for details, you'll be surprised.
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Very Robust—completely sealed unit requires no attention. No pivots, galvos or other delicate moving parts.
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Immediate delivery—Instruments ranged 0-120° C, 0-200° C, 0-300° C and 0-500° C available from stock in Manchester, London, Walsall, Stockton and Edinburgh. Other standard ranges in stock at Manchester. Telephone your urgent requirements to Wythenshaw 3251 Trafalgar 3154, Arbortum (Walsall) 55343, Stockton 68617 or Edinburgh 32035 (A. R. Bolton).

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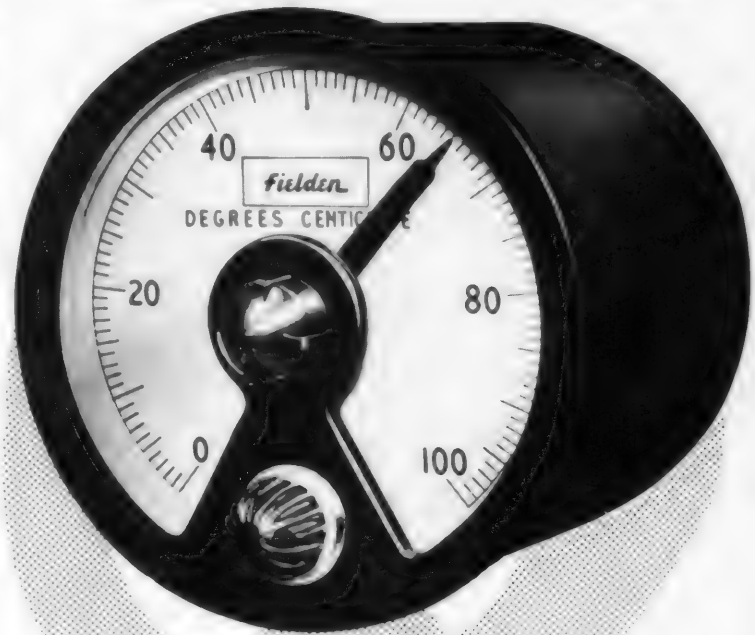

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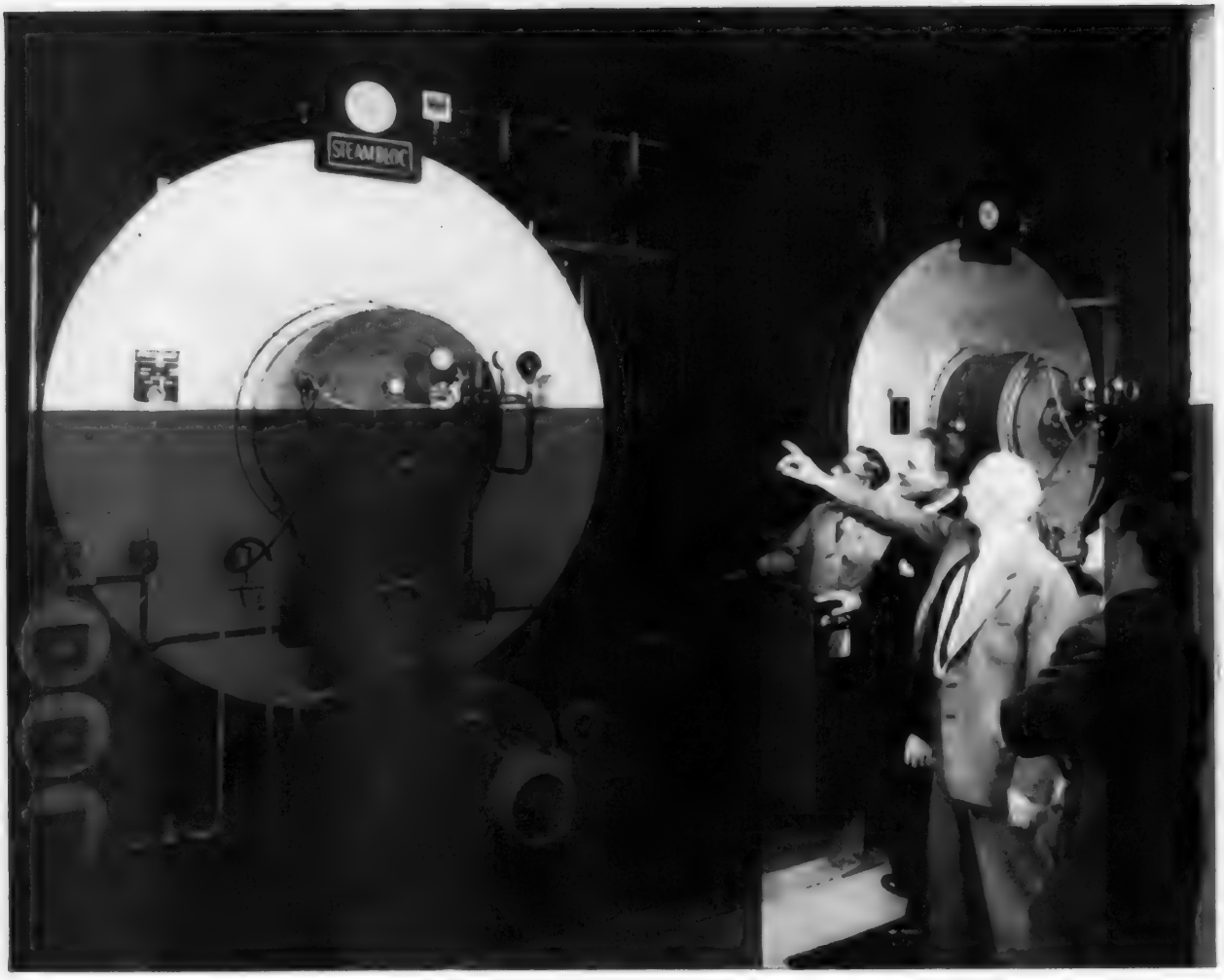

and this is our boiler room...

Can you, as a foodstuff manufacturer, point with pride to your boiler room? Does its spotless appearance reflect the high standards of your manufacturing and process plant? So often soot, smoke, clinker and heaps of fuel make this a part of the factory which visitors are never shown—unless, like Messrs. Fullers Ltd. whose boiler room is shown above, you have a Steambloc installation you can really be proud of . . .

spotless STEAMBLOC

Automatically oil-fired and completely self-contained, these packaged boilers are perfectly clean in operation, and immaculate in appearance. Nothing, in fact, could be cleaner. Make a showpiece of your Boilerhouse by installing Steambloc. Many large and small food manufacturers have already done so.

efficient STEAMBLOC

Steambloc provides not only a model appearance, but a matchless performance too. Under normal conditions its efficiency is well over 82% and often exceeds 85%. Because Steambloc combustion is complete, it gives maximum fuel economy. It burns the heaviest (cheapest) grades of fuel oil—up to 7,000 secs. viscosity, Redwood No. 1 at 100°F.

installed and operational in 24 hours

Covered by one all-inclusive order, Steambloc is delivered as a single compact unit, fully works tested, complete with all ancillary equipment, and can be installed and operational within 24 hours.

No special foundations or brickwork are needed: it is necessary only to place the unit in position and make connections to water, steam, oil and electrical services, and flue.

new patent twin rear door exclusive to STEAMBLOC

SBC have the real answer: the New Patent Rear Door facilitates sealing the end of the first gas pass with a separate door, and in turn the separate main rear door seals the gas chamber at the end of the third pass. This affords easier manipulation and minimizes the possibility of hot gas leaking from the end of the first pass into the third pass and cuts maintenance time and costs. The rear observation post is still included.

for good examples

The photograph opposite shows the Steambloc installation at Messrs. Fullers Ltd. Other prominent Steambloc users in the world of foodstuffs include Batchelors Pure Foods Ltd., Campbells Soups Ltd., Cow & Gate Ltd., Express Dairy Co. Ltd., Kellog Company of Gt. Britain, Nestlés Ltd., Tate & Lyle Ltd., United Dairies Ltd., and T. Wall & Sons Ltd.

for foodstuffs factories spotless **STEAMBLOC**

is, in short, the best-proved and most hygienic method of providing all the hot water or steam required. In its wide range of sizes—from 1,500 to 25,000 lb/hour (from and at 212°F) there is a STEAMBLOC to meet **your** needs. **PROVE IT:** ring us and we will send more details—or, better still, our technical representative.

the new **SCB** review

will contain news of the latest developments in steam techniques, new installations, interesting applications. Secure your regular copy of "STEAM IN INDUSTRY" by asking to be put on the mailing list.

STEAMBLOC

fully automatic packaged boilers

SBC

STEAMBLOC—*a product of the Babcock & Wilcox organisation*

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SBC4

KELLIE

AUTOMATION EQUIPMENT MODERNISES GERMAN JAM FACTORY

Batteries of rapid boiling pans equipped with independently controlled gravity-flow glass delivery pipes.

The high quality and purity of the products of Schwartauer Werke A.G. of West Germany owe much to Kellie experience and planning in the provision of equipment for the jam finishing line, which fulfils all the functions of true automation. Here is one of the most modern jam factories in the world, functional testimony that Kellie automation equipment meets all the requirements of modern techniques.

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FOR MODERN FOOD PLANT

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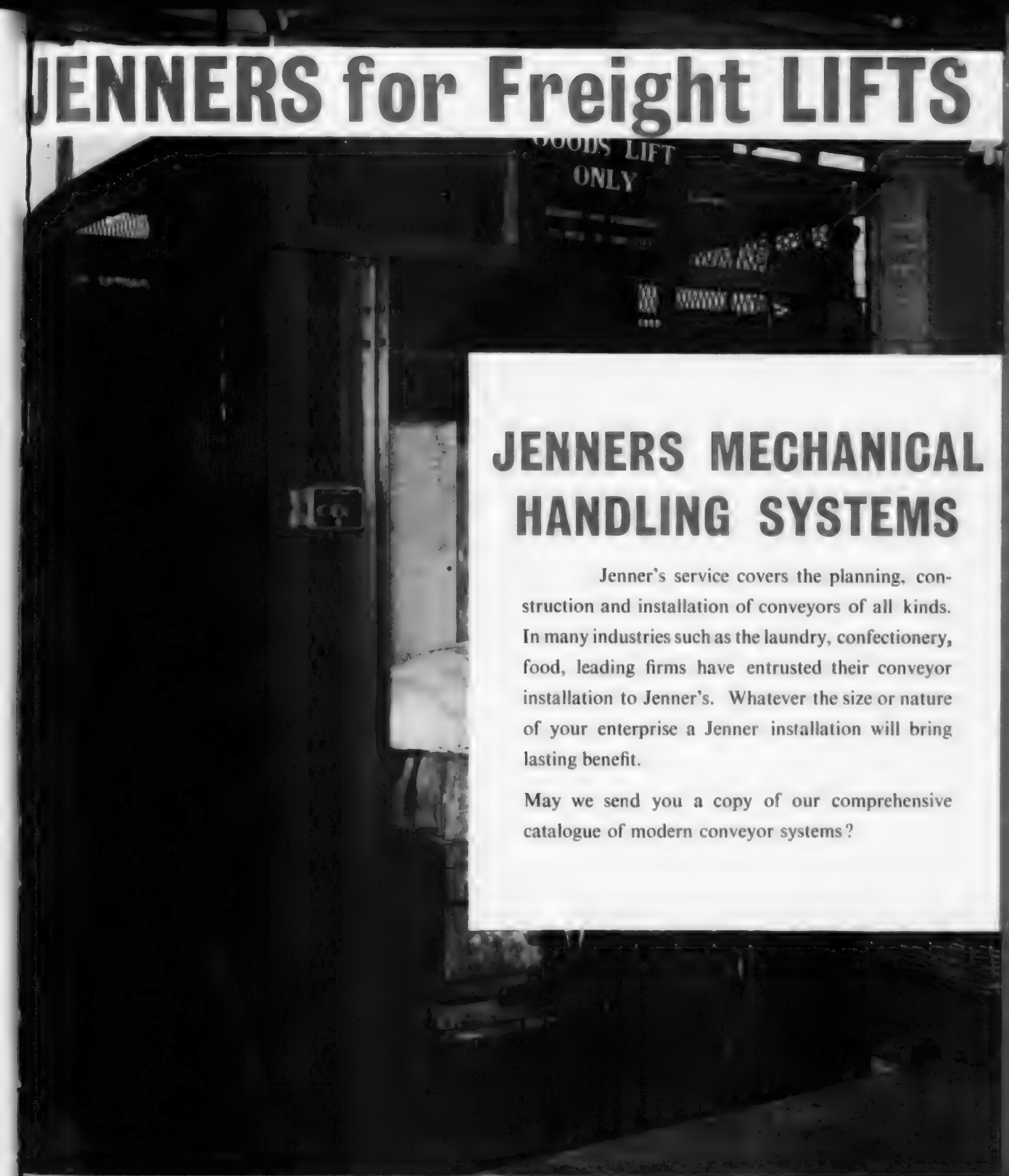

JENNERS MECHANICAL HANDLING SYSTEMS

Jenner's service covers the planning, construction and installation of conveyors of all kinds. In many industries such as the laundry, confectionery, food, leading firms have entrusted their conveyor installation to Jenner's. Whatever the size or nature of your enterprise a Jenner installation will bring lasting benefit.

May we send you a copy of our comprehensive catalogue of modern conveyor systems?

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CONVEYORS—
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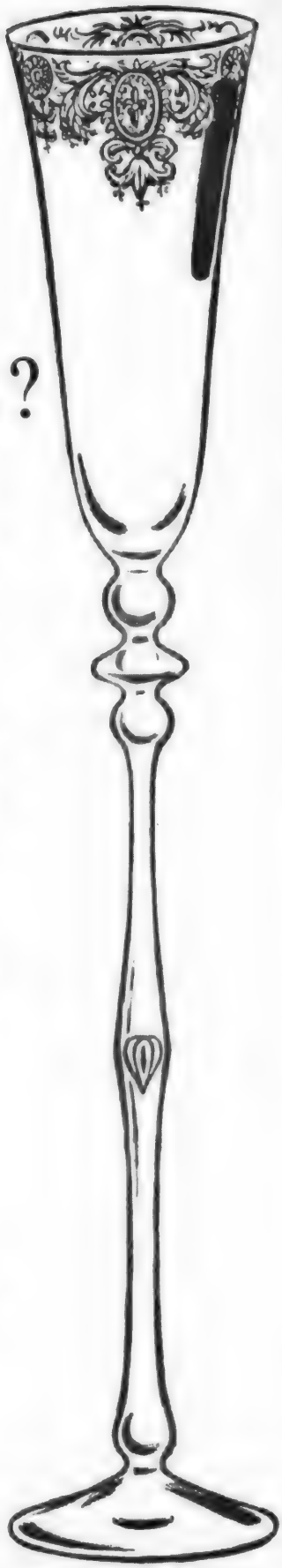
Who is a gourmet?



Your customers are. They enjoy good flavours. They like the taste of your products, that is why they keep on buying them. It is most important to them and you that your flavours remain the same.

StaffordAllens are making flavours today on which leading manufacturers have built up world-wide sales of now famous products over a period, in some cases, of twenty or thirty years. For consistent flavours you can rely on StaffordAllens.

For new flavours, too, StaffordAllens have a happy knack of hitting that popular, mass-market appeal. Why not consult Stafford Allen & Sons Ltd., Wharf Road, London, N.1, Telephone: CLErkenwell 1000?

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JUST WHAT EVERY HOUSEWIFE HAS BEEN LOOKING FOR

the sauce bottle cap that combines perfect protection with finger-tip release

Made of pure aluminium with a P.V.C. (Polyvinyl chloride) disc, FLAVOR-LOK cannot rust, admit dirt, discolour the contents of the bottle. As its plastic disc is flowed, instead of punched, into the cap the bottle neck is sealed at the sides as well as the top. The simple, finger-tip release is made possible by an exclusive feature—a three start thread.

Every woman who likes your sauce or Ketchup will like it even more when she finds it has the new R.O. FLAVOR-LOK SEAL. For then, when she opens the bottle, she will find it as perfect as when it left the factory: no dirt or foreign matter under the cap, no dark discoloration. Yet — she can twist that cap off and on in one-third of a turn with her finger-tips.

FLAVOR-LOK has been introduced to Britain by Metal Closures Ltd, who are producing it by fully automatic flow-line equipment, specially installed to meet what is anticipated will be a tremendous demand.

R.O. FLAVOR-LOK SEAL

AND SET YOUR CAP AT NEW PROFITS

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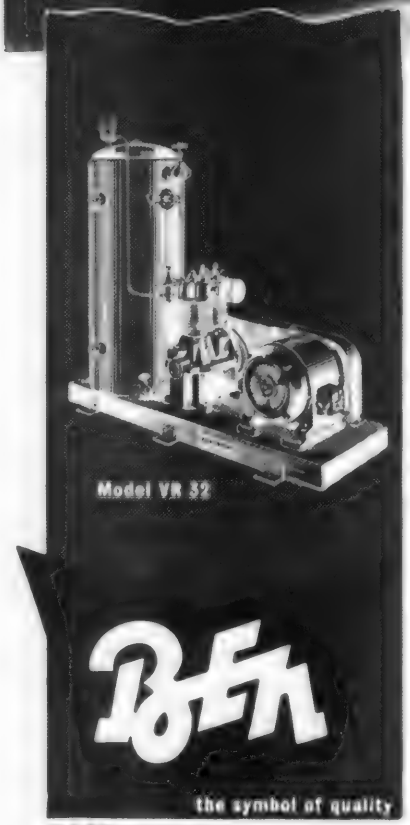
Situated on the Outer Needle Rock, the most westerly point of the Isle of Wight. Built in 1854-58, the tower is 109 feet high and is painted white with one red band. The light was first exhibited on 1st January 1859; it is 80 feet above water, has two white, two red and one green sectors occulting every 20 seconds and is visible 14 miles. Candlepower of the white sectors is 35,000, of the red 35,000 and 14,000, and of the green 8,000.



For all food manufacturing installations where safety and reliability are of equal importance, the obvious choice is AIR POWER — and B.E.N. Compressed Air Power at that!

B.E.N., who have over 30 years of experience behind them, are proud of the fact that TRINITY HOUSE have specified B.E.N. Air Compressors and Compressed Air Equipment in several of the Lighthouses surrounding the British Isles.

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Yes, just what do they mean Mrs 'B'?
Fifty million mouths to feed
is the tall order that British bakers
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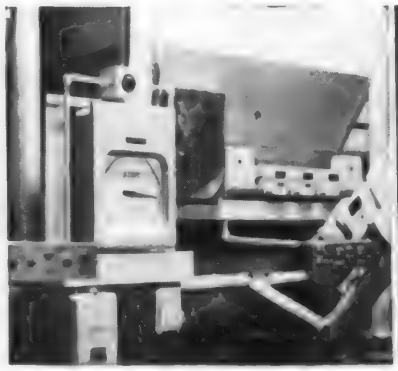
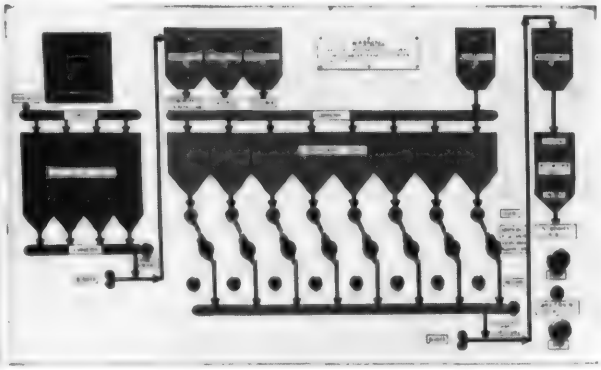
of order that doesn't allow time
for "touching".
Flour at one end loaves at the other and
not a hand between—that's what we're really after.
Not quite there yet, but Elliott process control is
certainly a step in the right direction.

ELLIOTTS think about food



(*left*) Part of Elliott automatic flour weighing installation in a bakery of Messrs J. Lyons & Co. Ltd.

(*right*) Hopper Control Panel as supplied to Thomas Robinson & Son Ltd., for a large flour mill in Manilla.



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- They afford protection for branded products and reduce pilferage and evaporation.
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3 selected maize hybrids
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5 all farm and field seeds
6 all pot-herb seeds
7 all flower seeds
8 wheat germ and bran
9 maize germ
10 cocoa shells

These materials can also be treated: almonds, beans, peanuts, ceramic materials, chicory, wood-shavings, clover, coffee, cork, flax, hemp seed, lentils, oleaginous seeds, peas, raisins, rice, salt, sand, sawdust, etc.

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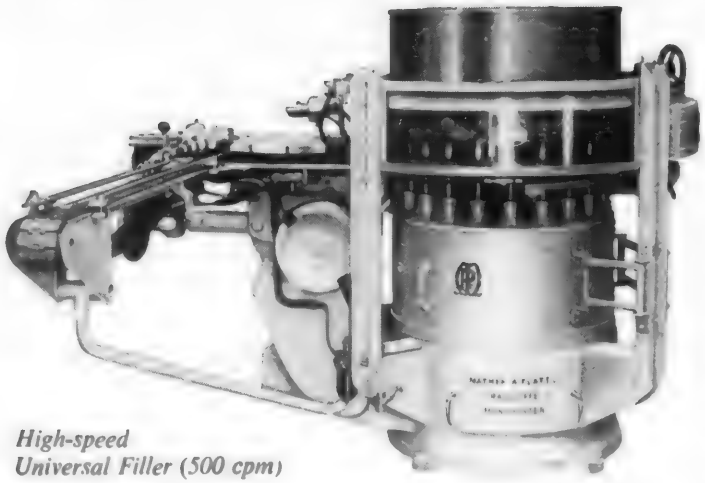
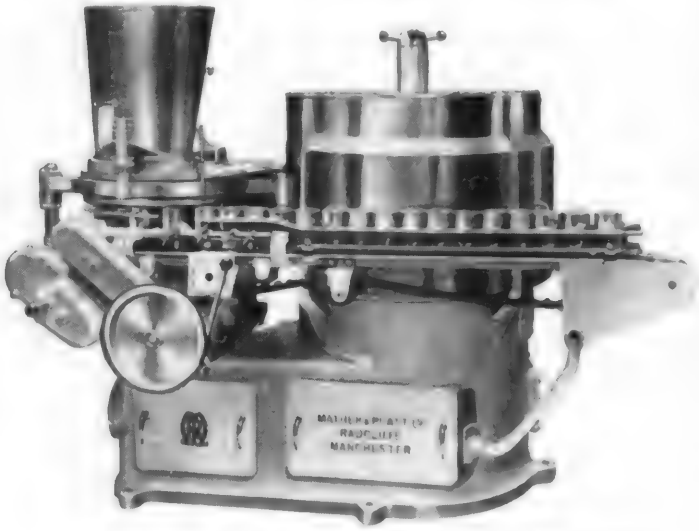


High-speed Universal Filler (500 cpm)



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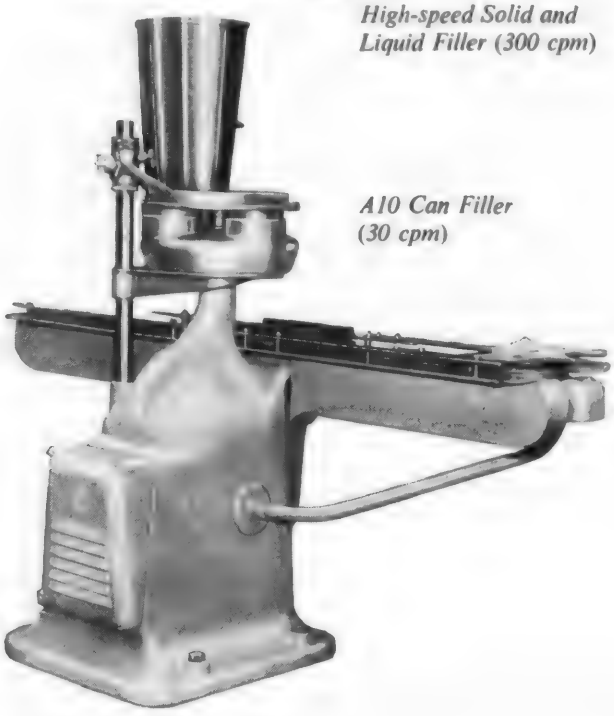

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It will handle from 50 to 500 or more containers per minute, with equal facility, depending on size of can and consistency of feed. The label magazine holds 3,000 labels and can be re-filled without stopping the machine.

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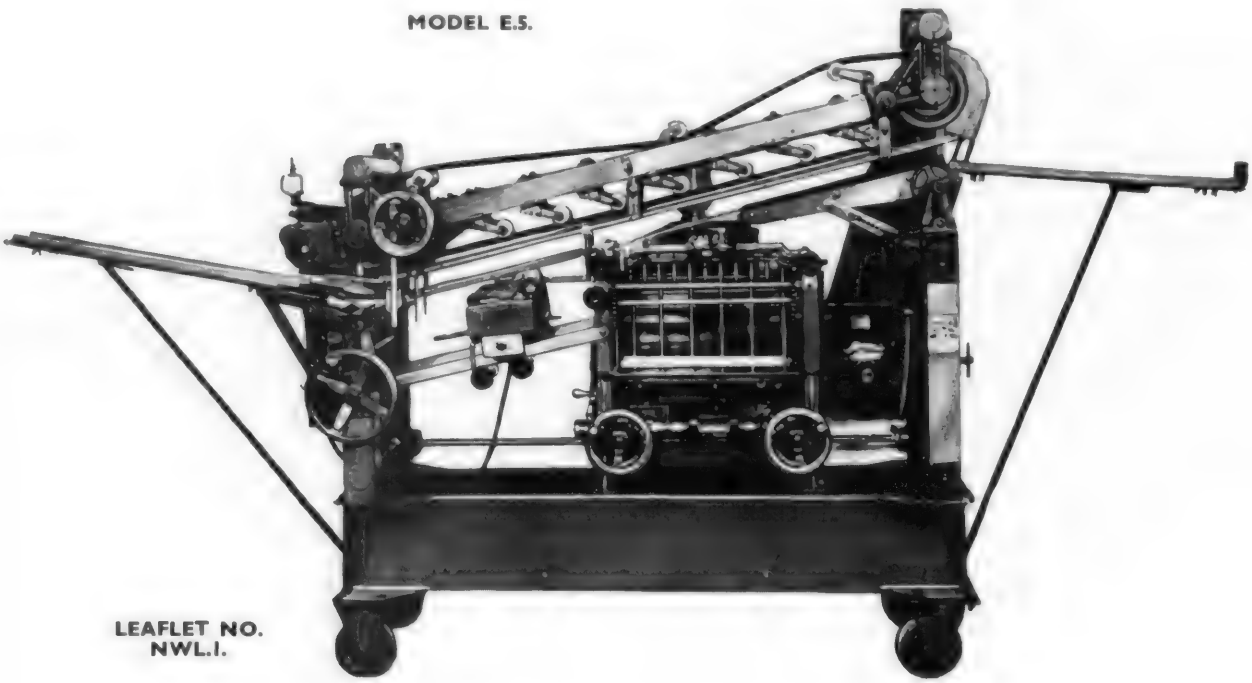

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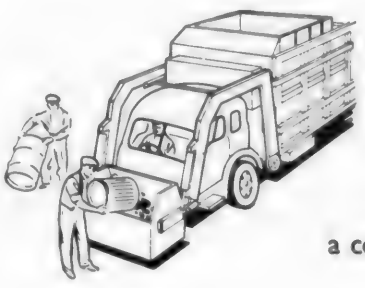

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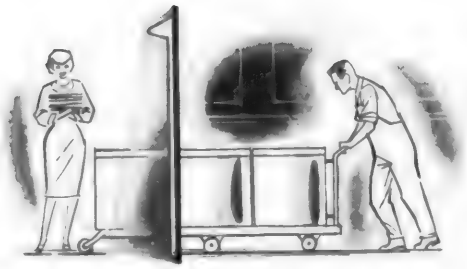
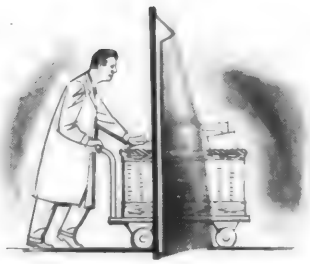


Safe because it is translucent, hygienic, allows easy passage for speedy handling of goods between departments where constant usage is necessary.



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door

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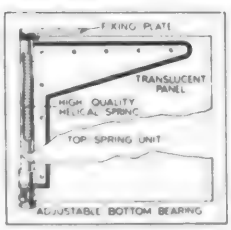

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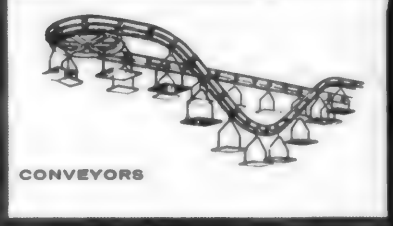

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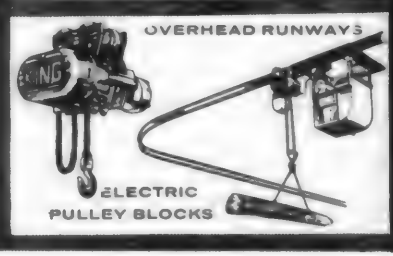

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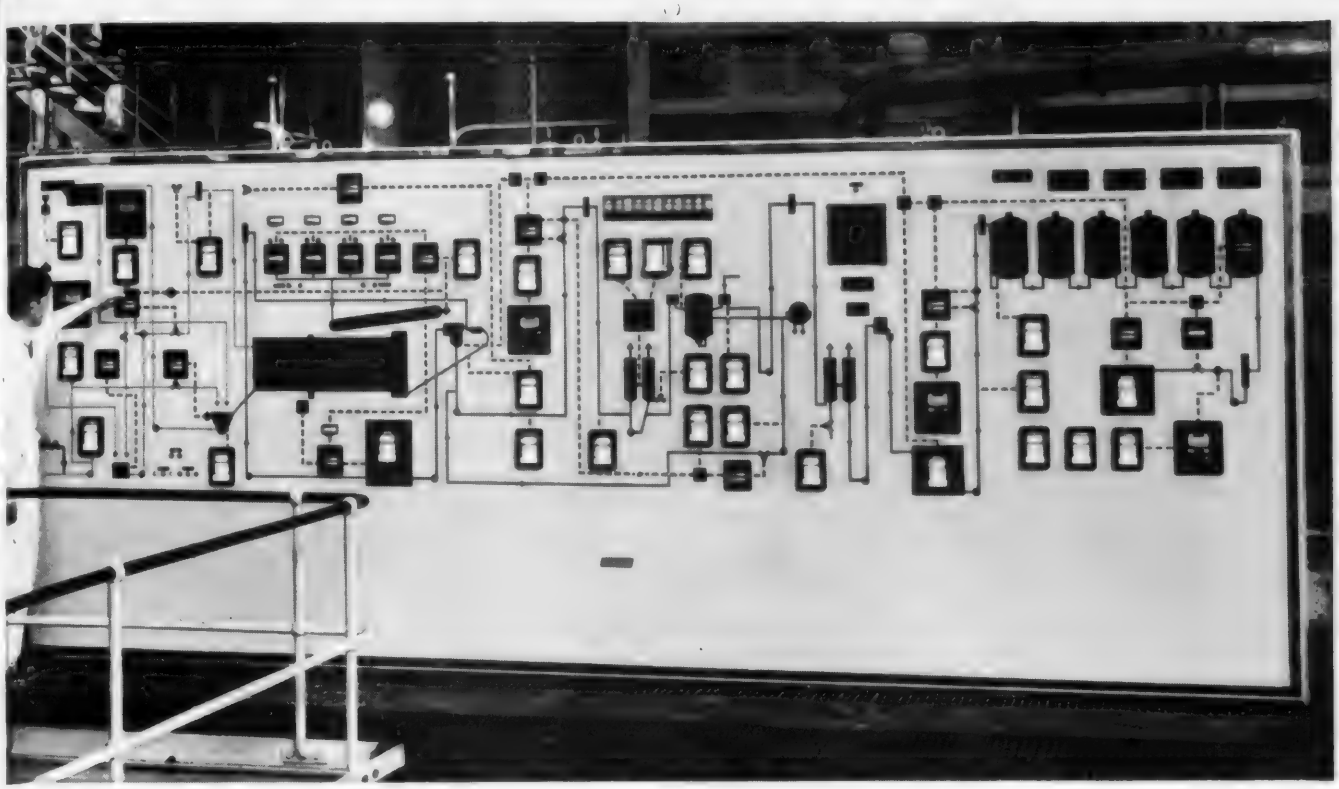

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FOOD MANUFACTURE

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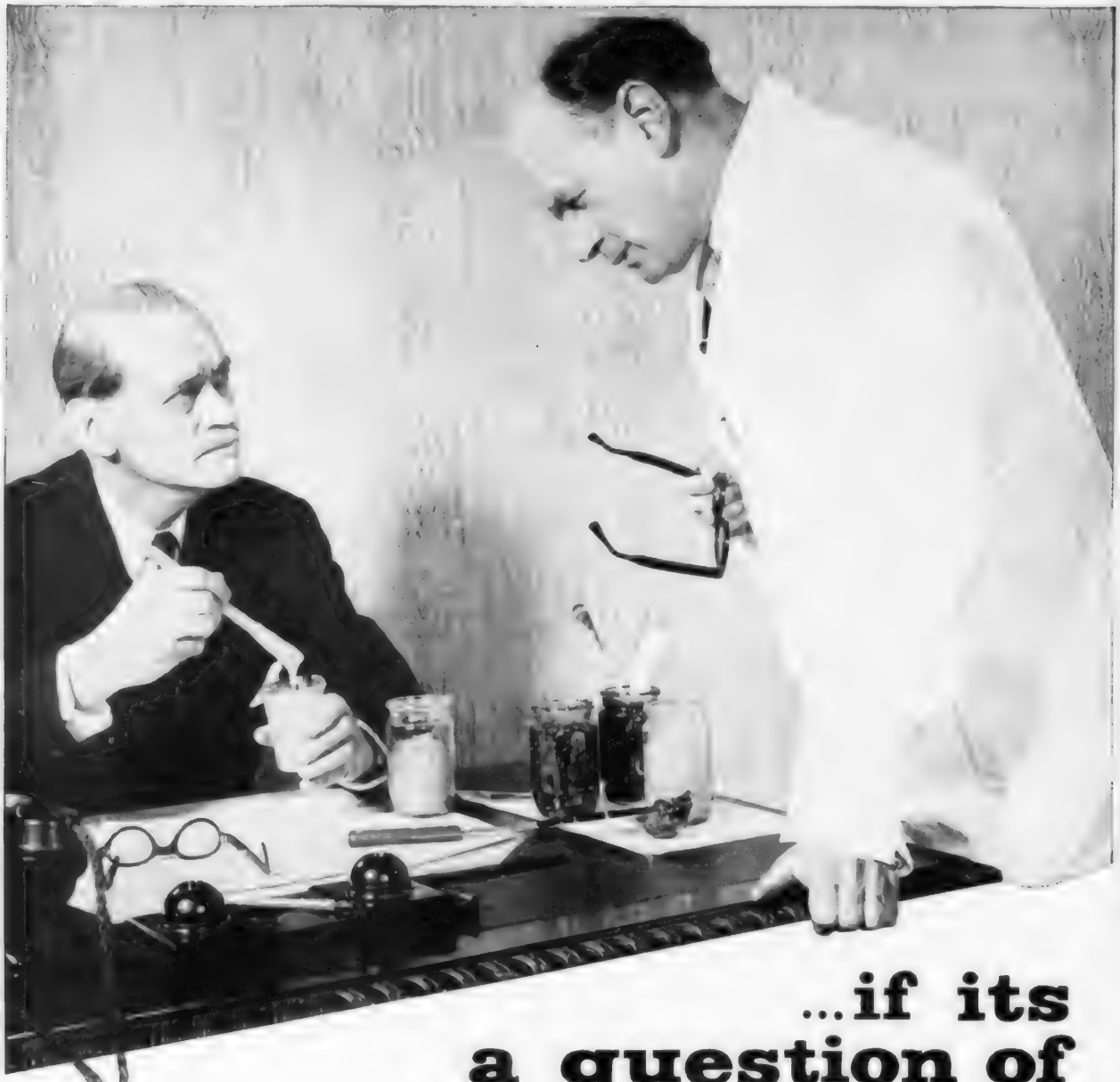

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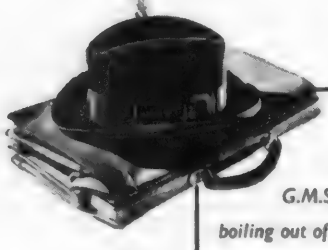

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FOOD MANUFACTURE

Vol. XXXIV, No. 10 October 1, 1959

A fish-shy nation?

THE state of the North Sea fisheries "continues to be a cause for grave concern," says the twenty-fourth annual report of the Herring Industry Board. Total landings of herrings by British vessels in 1958 were 633,570 crans compared with 683,863 crans in 1957. While the consumption of fish in the United Kingdom is going down, that of the world generally is increasing by about 5% per annum, according to figures published by F.A.O.

With rising living standards, the percentage of the national income spent on food is falling, and quality is a much more dominant factor than price. Traditional methods of marketing fish are no longer good enough, and as has been more than once pointed out recently in this journal, the fish industry is having to revise its ideas drastically in all departments. Self-service marketing is having a profound effect on the shopping habits of the British housewife; there are now something like 6,000 self-service stores in this country, and their number is rapidly increasing. This means that the goods themselves are replacing the shop assistant as salesmen; being silent, they must rely on visual appeal alone, and packaging and presentation become more important.

Where fish is concerned, this challenge is being met by the introduction of prepacked quick-frozen fish; although several large firms in the trade are changing over to this form of retailing, the market is still virtually untapped. Machines and wrapping materials for this form of packing are available, handling techniques are known. It remains to use these on a large scale. We believe there is a latent demand for good quality fish attractively presented; given sufficient drive on the part of processors and distributors, fish consumption may be greatly increased.

Work study and ice cream

A RECENT visit to the Bridge Park ice cream factory of J. Lyons and Co., Ltd., brought to mind Mr. Mark Bogod's lecture to the Institute of Production Engineers, in which he described the planning of this great plant. Few things can be more fascinating than the methodical step-by-step development of a large factory, especially one which is built, as was Bridge Park, on an undeveloped site with very little in the way of services laid on. The enterprise is a triumph for Work Study, which in its broadest sense was defined by Mr. Bogod as the systematic investigation of a situation or an operation; it has both strategic and tactical aspects, akin to what in our military days we used to call "an appreciation of the situation."

When the term is mentioned in polite society, "work study" usually conjures up a mental image of a time and motion expert with a stopwatch standing over an unco-operative Bill Jones while he performs some simple repetitive task; Bill Jones, suspecting that the management is hatching some dark plot to make him work harder, is anxious, of course, to prove how difficult and lengthy the task is. The opportunity for work study in the food industry is by no means limited to production processes; its scope is as wide as the enterprise itself. The results of work study are usually specific to the problem being studied, and the aim of the study is to discover the best way to carry out a particular operation rather than to lay down general principles. It is therefore only worth while undertaking a work study if the economies likely to be achieved are greater than the cost of the study itself, such as would be the case where work was regularly repeated or where the results of a particular study could be applied to many other similar situations.

One of the examples quoted by Mr. Bogod where work study paid handsome dividends was in the packing of a certain brand of ice cream. As a result of experience it became possible to design plant to produce this brand with double the output for the same floor area, but it was not possible to place double the number of packers round the machines. Work study showed that the largest element of work was in picking up the individual pieces of ice cream and putting them in the cartons; whereas previously only four pieces could be picked up by hand at a time, by designing a special tool for picking up the pieces, handling speed was more than doubled and greater comfort for the packers was achieved because they no longer needed to touch the cold pieces with their hands.

Battle of the markets

PRICE cuts by the leading manufacturers of frozen foods, ostensibly the result of exceptionally good harvests, underline the fierceness of the competition to woo the consumer. At present, frozen foods comprise only a ¾% chunk of national food consumption, compared with 3½% in U.S.A., but yearly consumption grows apace, and recently the chairman of Birds Eye, Mr. James Parratt, said his company would be very disappointed if next year's turnover did not exceed this year's by 40%.

Frozen foods are coming right out of the luxury class as the public becomes more refrigeration conscious. Twice as many domestic refrigerators were sold on the home market this summer as last, a most significant trend which goes hand in hand with the increasing public demand for higher and higher quality. The bottleneck in the expansion of the frozen food trade at present appears to be in retail distribution; many retailers are understandably reluctant to expend the heavy capital outlay on freezing cabinets, but those who take the plunge must in the long run reap the dividends.

Preservation by quick freezing is the most logical and least damaging method of preservation; on the principle that you can't get out what you don't put in, the quality of food in the frozen state cannot be higher than it was when fresh, but whereas other methods of preservation sometimes alter the character of the food and change its flavour, disguising in some degree possible deficiencies in quality, frozen food when thawed out is nakedly and unashamedly the image of what it was before freezing. Competition will ensure that manufacturers will accept nothing but the best, which will keep growers and suppliers even more on their toes. Which, says the consumer, is a very good thing.

Drink tea and stay alive

IF a report from Japan is correct, it may be that an effective antidote to radioactive fall-out is tea. Dr. Teiji Ugai and Dr. Eiichi Hayashi, so we are informed, have carried out experiments with mice for two years, and conclude that the tannin in tea absorbs strontium 90 before it reaches the bone marrow.

Each mouse was fed with one microcurie of strontium 90; up to 14·8% was absorbed into the bone marrow. Those mice which were given a solution of 2% tannin from tea eliminated most of the strontium within 48 hours, we are told.

Experiments are in progress at the radiobiological laboratory at Wantage to investigate the brewing of tea in radioactive water. It seems that strontium has a tendency to be absorbed by the tea leaves; freshly-brewed tea absorbs 25 to 30%, and after standing for 17 hours the activity is down to about 10%. We think, however, that the palatability (or is "potability" the correct term?) of tea which has stewed for that long in the pot would be rather inferior.

"Instant tea," which has now appeared on the British market, is thought to be more effective because it is more concentrated. Will this discovery, if indeed it is anything more than a flash in the pan, revolutionise the drinking habits of nations?

The slowly changing scene

THE changes which have come about in the last few years in the grocery and provisions trade—the advance of the self-service store and the supermarket, the modern housewife's demand for hygienically packed and easily prepared food—have all led to a substantial increase in the number and activities of the firms behind the scene who are indirectly associated with the grocery trade. The expansion of the last decade appears to be settling down, and there are no signs at the moment that we can expect another spurt in the packaged grocery trade comparable with that of the last few years. At the same time there is every indication that the number of firms competing for orders will grow, and that the market will become more and more competitive.

Many of the firms involved in this slow down in the expansion race are fortunate in that they are able to divert some of their production to other markets. Others, however, are finding that they are up against greater competition than they have known since prewar days. In the packaging field, many food manufacturers have adapted their packaging to the demands of self-service marketing, and, while there are still some firms who do not rely on "eye-appeal," if there is much more to be gained in the grocery trade it must be made at someone else's expense.

New trends are often slow in making their presence felt, and speculation on the future of a new product would be foolhardy. With exports stable and the domestic consumption of food more or less stationary, threats to established packaging materials cannot be considered other than as alarming by those firms who do not move with the times. Tin, glass, and paper are under constant threat from such materials as aluminium foil and the many varieties of plastic wrappings. Packeted soups and frozen foods are competing more and more with the can, and the Metal Box Co., Ltd., to mention only one big name in the packaging business, are meeting this challenge by producing more and more cartons and plastic wraps. Tinplate manufacturers are watching closely the slight increase in the use of aluminium cans, while plastics are appearing more than ever on the grocery counter instead of glass.

Will these trends continue or burst like bubbles which disappear at the first prick? Who can tell in these days?

One thing is sure; if the expansion in the grocery trade is slowing down as the pundits say it is, manufacturers must be well equipped to extend their activities in other directions.

An extraordinary statement

"My experience has never led me to believe that when the processor takes over, there is benefit to the producer or the consumer," said Mr. J. L. Davies, General Manager of the Milk Marketing Board of England and Wales, at the International Dairy Congress. We would not have expected Mr. Davies to make as silly a statement as that, even though his remarks were concerned only with milk, but he said a number of other things which, as they were spoken in front of distinguished people from overseas, might spread the impression abroad that here in this country our thinking is out-of-date and unrealistic.

Milk is nature's finest food, said Mr. Davies, adding that "our task in the next generation should be to save it from the processors. In this country we have a law which says that milk should be sold as it comes from the cow. That is a very valuable provision and it should be part of our policy to preserve that. I pray that we shall not be forced to submit to the machinations of the scientists, engineers, processors and all those highly efficient people who want to make milk into something else."

Those wicked scientists again! How terrible is the spectre of efficiency! It always seems to us that those who denigrate the benefits of modern technology want to eat their cake and have it too; they don't mind enjoying the advantages but they don't want the bother. Has there ever been an era when age has not looked back on its youth, wreathed in a rosy mist, and not sighed with regret? "The older one gets . . ." Ah! There's the clue.

Cow's milk primarily is the food of young cows; it is not necessarily the best food for humans. It does happen to be a very good food, but it is not ideal. For example, it is not as good for babies as is human milk, as many of our forbears learnt to their cost. Would Mr. Davies condemn the preparation of infant foods, based on milk but more nourishing?

It is inevitable in these days when the congestion of life is growing and transport costs mounting, that milk's high water content should be looked at askance. Why pay money to cart water about, if it can be removed without detriment to flavour and quality? To this end the efforts of research must increasingly be directed, and if they succeed, much good will have been achieved.

Bringing up baby

AFTER a slump in the baby food business some years ago, which caused one of the pioneers in the trade, Allen and Hanbury's, to abandon the market in 1953, the business is prospering again, according to a report in the *Financial Times*. One of the most noteworthy developments has been the growth of strained foods which provide the older baby with a balanced blend of vegetable, meat and fruit constituents. Sales have more than trebled since these products appeared about 12 years ago, and most of the credit for this is ascribed to H. J. Heinz Co., who are estimated to supply over 90% of the market for this type of baby food.

The growing popularity of branded baby foods is due in part to the fact that more young mothers are going out to work, and also to the fact that mothers tend to leave the welfare clinic earlier than they used to. Easily prepared foods are a great boon to such mothers who have little time to spare for home feeding or preparing and cooking baby's meals in the traditional way.

The baby foods manufacturers' stiffest competitor has been the Government, who by subsidising heavily National Dried Milk Powder, enabled this to be sold much more cheaply than branded products. The Government's policy of reducing food subsidies, however, has raised the price of dried milk powder from 10d. to 2s. 4d. per 20 oz. in the last two years, which brings its price much closer to the 3s. 6d. or so which branded foods cost. It is probable that the share of the market held by the National product is now much less than half.

The full potential of this market is thought to be very far from being realised, and although some medical authorities still regard these prepared baby foods rather doubtfully, the integrity of the well-known manufacturers who emphasise that their products are highly nourishing, and the unquestioned bonny healthfulness of the babies we see around us will surely eliminate the remaining prejudice against branded foods.

Caveat emptor

SOME of our business friends are perturbed at the activities of the new *genus* "Management Consultant" which has proliferated rapidly in the last few years. These gentlemen offer to tell firms how to improve their internal efficiency and sharpen their external competitiveness. They claim to be able to bring to this work an impartial approach and a truly omniscient expertise and, naturally, they expect fees commensurate with their formidable talents. Our friends are naturally puzzled as to how complete strangers can walk into their factories and offices

and tell them how to run them better than they have been doing for years. Perhaps we have heard only one side of the story. Perhaps these consultants can do what they claim to do. But our own knowledge and that of our friends leaves room for doubt.

An activity allied to management consultancy is the selection and placement of executives, scientists, and managers. Some consultants do both, and again their fees are many times greater than those of the normal employment agency. One firm we know employed consultants to "reorganise" their business, and one of the recommendations they received was that they should engage a kind of super salesman. The consultants went further and produced a candidate for this important job, who was duly engaged. After some months our friends became extremely unhappy about the activities of this gentleman and began to make enquiries about him. It was discovered that one of the key reasons for engaging him was a testimonial written on the impressive notepaper of a well-known firm. This firm was consulted, and they confirmed that the man had indeed worked for them for a few months. But when the testimonial was produced they pointed out that he had left them several months *before* it had been written. Closer inspection revealed that the "testimonial" had been written and signed not by a competent director or manager of the company but by another ex-employee, who had written it several months after he had left the company. The letter was, in fact, completely worthless and in effect a fraud.

We hope that this unhappy business is only an isolated case, but it throws a most unfortunate light upon the activities of management consultants and "personnel experts."

"Deliciously tender cardboard!"

WE were very glad to see a recent article in the *Daily Telegraph* calling attention to the poor flavour of broiler chickens and eggs from intensively kept hens. The writer aptly said that a well-cooked broiler reminded him of deliciously tender cardboard. However refined and economic a technique may be, its success or failure depends on the quality of its end product. The broiler industry has come in for a lot of criticism lately on the grounds that breeding birds intensively is an outrage against Nature, but one fancies that the growing belief that such birds make poor eating will do more serious harm.

No one questions that the old-fashioned roasting chicken bred in the open air is far tastier than the broiler bird. But the latter is cheaper to rear. So too with eggs. Big healthy birds reared on the open range lay large, well-flavoured eggs; it is easy to breed hens that lay large numbers of small eggs, a fact well-known to the old-time expert poultryman, but ignored by many who hoped to make quick cash profits. The result is that the market is now flooded with small eggs of poor flavour, while large eggs are scarce.

The tendency to put high output before all other considerations is spreading to all sections of the industry, to the detriment, we believe, of quality and flavour. Vegetables and fruit are the latest victims of this philosophy; certain varieties give very high yields but their flavour is insipid. We believe the broiler industry is doing a lot of good by putting poultry within the reach of those with moderate purses, but it must make quality one of its prime considerations. If it continues to produce "deliciously tender cardboard" its rapid growth may well be reversed.

A boom in scampi

SCAMPI, that prawn delicacy which one sees increasingly on the menus of the better restaurants, is bringing renewed prosperity to the Scottish fishing industry, so a correspondent informs us. The prawns, usually known as Dublin Bay prawns, have provided work for the Firth of Forth fishermen, unemployed as a result of the disappearance of the ring net.

Prawns for scampi are landed at Dunbar, Port Seton, Pittenweem, Lossiemouth, Stornoway, and a small amount at Ayr. The catches go to Berwick, Annan, and Inverness for processing.

Fish merchants on Stornoway say that the trade started there only this year, and forecast that prawn fishing would be a coming industry for the island. About 40 boats are expected to be working in the area next year.

At Lossiemouth, about 25 boats have been prawn fishing this season. There is, apparently, less work attached to prawn fishing, and as at Stornoway, it has come to the fore only this year. Until the introduction of freezing there was no commercial value for prawns. Scampi were introduced on a small scale at Berwick in 1947, and now about two-thirds of the Firth of Forth prawn fishing fleet is handled there. Up to 1,000 stones a day are processed, and about a third of the catch is exported to such places as the West Indies and the Persian Gulf.

Before 1950 prawn landings were so small that they were included under "miscellaneous shell fish," and no figures were kept. In 1950, 2,994 cwt. were landed and the catch was worth 37s. per cwt. In 1957, 27,028 cwt. were landed, worth £128,532. In the first six months of this year 19,450 cwt. were landed, valued at £119,308, which works out at between and £6 and £7 per cwt.

Boiled sweets in the making. (*Left*): A battery of gas-fired sugar boilers of the traditional type, on which sugar syrup is being heated in a copper pan. After the flavouring and colouring ingredients have been added and the heating finished, the thick syrup is poured on to a water-cooled metal slab (*right*) and cut with a frame cutter.

93 years of Boiled Sweets

A Visit to James Pascall, Ltd., of Mitcham, Surrey

For nearly a hundred years, James Pascall, Ltd., have been making high quality sweets. This article describes an exclusive FOOD MANUFACTURE visit to the sugar confectionery section of their factory at Mitcham.

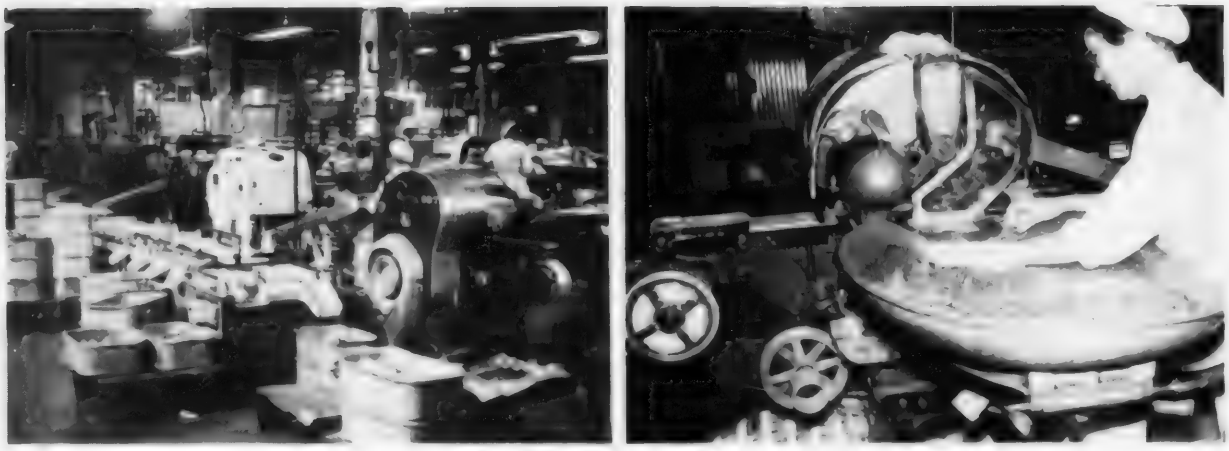
THE origins of James Pascall, Ltd., go back to a small two-roomed shop in Well Street, off Oxford Street, London, which was opened in 1866 by James Pascall. Shortly afterwards he opened a factory in Blackfriars. The present works at Mitcham was established in 1902, and during the 1920's all the firm's production was transferred to Mitcham, where it has remained to the present day. The factory now has a ground floor area of 322,000 sq. ft., and employs more than 1,300 people, over 800 of them on production. Within the factory grounds are a football pitch, tennis courts, bowling greens and a sports pavilion, and it is the firm's policy to encourage social activities among its employees and to keep them informed of company policy and business trends. Works conferences are held at which representatives of the workers put forward views and suggestions.

Sugar boiling

Although the constituents used and the operations performed are as precisely defined as in any scientific process, the making of boiled sweets is an art which demands much experience if high quality is to be achieved. It is therefore not surprising that some of Pascall's workers have many years of sugar boiling behind them. The basic operation is the heating of a mixture of sugar, water and glucose in a pan to form a thick liquid which when poured on to a cold metal slab, cools to a viscous plastic mass. Flavours, colours, essences and other ingredients are added, either in the boiling pan or on the slab, depending on the type of sweet, and the boiled sugar may either be moulded or cut to produce hard sweets of many varieties, or used as a casing which is filled with various confections to form soft-centred sweets.

The traditional method of sugar boiling in open copper pans over coke fires or gas burners is supplemented by boiling under reduced pressure in steam-heated vacuum cookers. The newer method, of course, is much quicker, and enables a larger quantity of syrup to be handled at a time, but the traditional method of fire cooking is retained for many lines because it imparts an indefinable quality of flavour, possibly the result of slight caramelisation, which vacuum boiling does not give.

There are several boiling rooms,



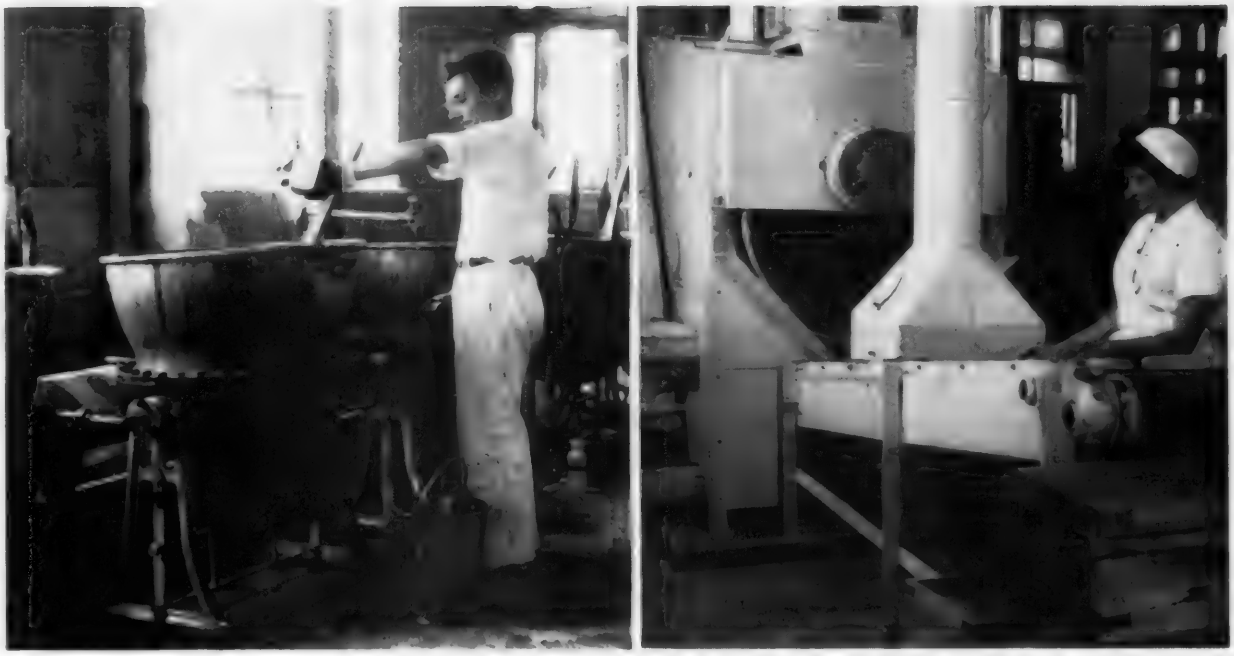
(*Left*): **A section of the packing department.** (*Right*): **A butterscotch wrapping machine.**

as they are called, and in the first one that we visited, barley sugar was being made. In this particular section there were ten boiling units, each consisting of two copper boiling pans and a metal water-cooled slab. Above each slab was a frame cutter, a pivoted metal grid in three sections, which is swung down on to the plastic sugar mass on the slab and which cuts it into a large number of small squares which become the familiar barley squares wrapped in transparent cellulose film.

A typical boil for barley sugar contained 37½ lb. of sugar, which was mixed with water, glucose, flavour and colour in a copper pan and boiled on a gas-fired boiler for 12 min. The contents of the pan were then poured on to the water-cooled metal slab which had meanwhile been given a thin coating of slab oil. A raised metal frame round the edges of the slab prevented the syrup spreading beyond the frame. The operator carefully smoothed the viscous mass to fill the frame exactly with an even depth of syrup. Cooling of the syrup is speeded up by currents of cold air directed on to the surface by overhead ducts. After about five minutes the syrup had set sufficiently to be cut by the frame cutter, whose three sections were lowered in turn on to the mass. When, after a few more minutes, the mass had set almost solid, the cutter sections were gently eased up to free them from the sugar. The experience of the sugar boiler helps him to know when to release the cutter sections. After being worked up and down a few times, which assists the cutting of the sugar, they were lifted clear of the table, leaving the slab of barley sugar divided neatly into a myriad tiny squares. The edges of the slab not of regulation shape were trimmed off (the trimmings were used in a subsequent boil) and by means of a knife the slab was divided into a number of manageable portions, as the squares produced by the frame cutter still adhered to one another by a thin film of sugar. The portions were passed along the table to a woman worker, who subdivided them further before pushing them on to an inclined vibratory screen, which broke down the portions into individual squares and deposited these in a collecting bin. At the present time the bins from each boiling unit are taken by hand truck to the packing rooms, but shortly a conveyor will be operating to do this automatically.

Manufacture of centre-filled sweets. (*Left*): **The sugar mass is rolled in a batch roller (shown in the left background) round a copper tube through which is fed the filling. The extruded "rope" is hand-fed into a Super Rosta-Plast equalising machine.** (*Right*): **Sweets are falling into a collecting bin from the cooler, having been formed in the die-head.**

The method described for the manufacture of barley sugar is typical of that used for many different kinds of boiled sweets, the



Jelly manufacture. (*Left*): **Mixing the ingredients in a boiling pan.** (*Right*): **A "sanding" machine in which jellies are coated with sugar.**

only difference being the flavour and colour used and the point at which they are added; for barley sugar the flavour is added in the boiling pan; in lines where the flavour is more volatile or less stable, it is added to the cooling mass on the slab, the mass being stirred and folded over repeatedly to ensure thorough mixing.

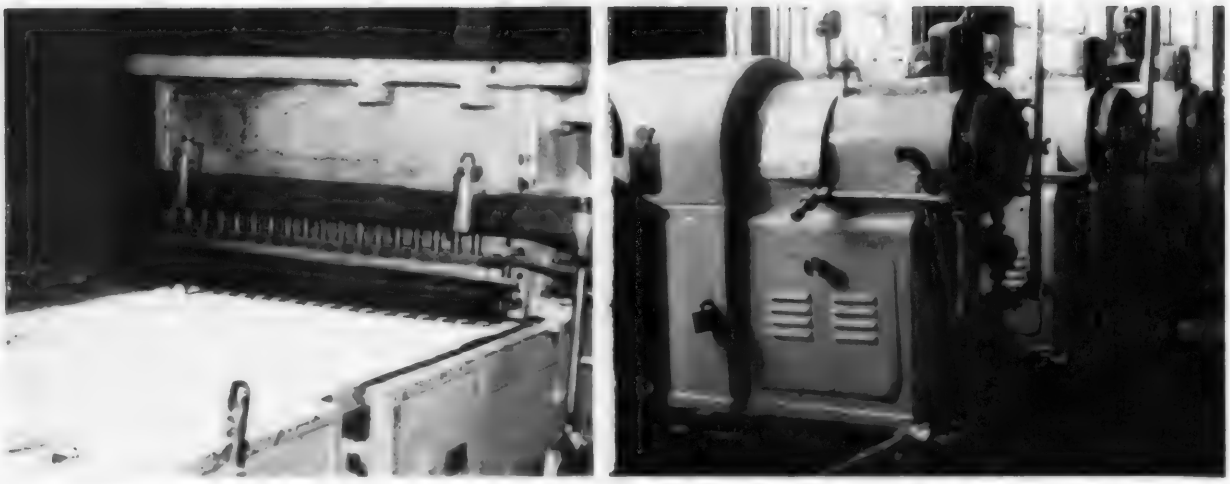
Vacuum boilers

On the other side of the same boiling room two vacuum boilers and a number of additional gas-fired boilers of the older type were being used to make clear mints, glucose mints, fruit pieces and butterscotch. The Hansella 18C vacuum boilers are supplied with syrup which is made on a continuous basis; sugar is delivered from a storage bin to the hopper of a metering device by means of a conveyor; in the metering device the sugar is continuously dissolved and at the same time mixed with glucose delivered at a constant rate by a metering pump. The syrup passes out of the metering device through a fine-mesh filter into a collecting vessel, whence it is pumped as required to one or other of the vacuum boilers. Each vacuum pan can discharge a 70 lb. batch of cooked toffee base every 3 to 4 min., according to the operator's setting of the plant. The vacuum cookers operate at about 290°F., depending upon the grade of base required. Variations of temperature are controlled by adjustment of steam pressure.

Products which are cut on the slabs with frame cutters have their colour and flavour added immediately after the syrup is removed from the vacuum boiler, for which purpose the syrup is poured into a copper pan, the ingredients added (for convenience, colour is made up in solid pieces of exactly the right amount for each batch) and the cooked base warmed on a gas boiler for a minute or so before being poured on to the metal slab for cutting as previously described. The warming is necessary because the addition and stirring in of the ingredients cools the syrup slightly.

In the next boiling room a much wider variety of sweets was being made, including peppermint sticks, fruit bonbons, fruit salad, acid drops, and several kinds of striped sweets. In this room were three vacuum boilers, two Hansella 18C machines and one Baker Perkins. The mixture of sugar, glucose and water was heated in two copper steam-heated pans before being pumped into the vacuum cookers. After removal from the cookers, the boiled syrup was poured on to slabs in the usual way, the flavours, colours and other ingredients poured on and stirred in, and the operation known as "folding in" carried out. As the hot viscous mass settles on the slab and slowly spreads over its surface, a skin forms on the underside which is in contact with the cold surface of the slab. This allows the operator to insert his gloved hand underneath the mass and fold it over, repeating the process a number of times and pressing the top down to flatten the mass between each folding. By this means the mass is well and truly mixed, and becomes rigid enough to handle yet soft enough to be worked. At this stage the mass is usually divided into three portions for convenience in the subsequent handling.

Striped work is produced by colouring several pieces of the mass and placing these in the de-



(*Left*): **A depositing machine in which jelly is injected into the impressions in printed starch trays.** (*Right*): **A battery of marshmallow creamery beaters.**

sired order on the main portion on the slab. The mass is then gently kneaded so that when it is subsequently drawn out into a "rope," the added colours appear as stripes.

Centre-filled sweets

The basic operation in the manufacture of centre-filled lines is the production of a hollow tube of boiled sugar casing into which is injected the filling. The casing is rolled by rotating copper rollers round a copper tube in a Hansella batch roller, and at the same time is extruded through an orifice at the outlet of the machine. A hopper containing the liquid filling connects through a metering pump with the copper tube, so that the extruded casing tube is filled as it is formed. The metering pump which supplies the filling has a piston of variable stroke, so that the rate of pumping can be adjusted.

On emerging from the batch roller, the sugar rope passes through a Baker Perkins *Super Rosta-Plast* equaliser, which rolls the rope to a uniform diameter between the concave rims of rotating discs. The rope next passes through a metal detector, a device which automatically stops the whole line should metal contamination be found, after which the rope continues through a Hansella die-head for forming the sweets. The sweets emerge in a web, adhering to one another like a string of beads, and after passing between the blades of a rotating beater which helps to break the chain of sweets into more manageable lengths, they travel along the conveyor of a two-tier Hansella cooling unit, where they are cooled in the draught of a number of air jets. From the conveyor they fall, now completely separated into individual sweets, into bins; these are removed when full and weighed by the Production Recorder, who records the output of each production line.

Products which are not centre-filled pass through a similar process, except that the rope formed is solid.

Air conditioned wrapping

The weighed bins next pass to the wrapping room, which is air conditioned and which is equipped with a large number of Rose automatic wrapping machines arranged in batteries, each battery feeding a moving conveyor which takes away the wrapped sweets. The machines are of three kinds, denoted by the code letters, IST, ISW and ISB; these indicate the type of wrapping produced, the first denoting twist wrapping, the second envelope wrapping, and the third bunch wrapping. The conveyor fed by each battery of machines is divided into a number of channels, one for each machine. Each channel feeds a separate collecting bin, so that when the bins are weighed the output of each machine can be checked. Each machine has a capacity of 135-140 sweets per min.

The wrapping machines are controlled by a female operator, each of whom looks after three machines. On each machine are mounted two electric lights, one red, one blue. When a fault or breakdown makes necessary the attention of a mechanic, the operator switches on the red light, which draws the supervisor's attention immediately to the trouble; similarly, when the feed-hopper of the machine is running low in sweets, or the supply of wrapping material is getting short, the blue light is switched on, so that the service attendant can see at a glance which machines need replenishing.

Manufacture of Jellifruits

Jellies are made in the starch department, being compounded in 106 lb. batches from pectin, apple juice, sugar, glucose, sorbitol and water. The ingredients are mixed in steam-jacketed pans and heated to 226°F. for about 40 min. Colouring and flavouring ingredients are added, and the mix is then pumped through a strainer to Winkler and Dünnebier depositing machines which automatically

deposit the liquid centres into mould impressions. These mould impressions are in trays and have previously been printed in starch by mould boards. The trays pass continuously along a moving endless conveyor and each row of impressions in turn receives its fill of liquid centre as it halts momentarily beneath the nozzles of the depositor.

After receiving a light coating of starch dust, the trays pass to a Currie automatic starch tray stacker, which takes each tray in turn from the conveyor and stacks it. When 32 trays have been stacked, the stack is automatically ejected from the stacker and passes to an automatic tipper which sieves the jellies, which by now are cool and hard, and reclaims the starch. The jellies next pass through a Bramigk coating machine which, after washing the centres with steam, coats them with sugar in a rotating drum. The coated jellies are then weighed and sent to the packing rooms.

Marshmallows are made in a similar way, except for the washing process, and packed by hand.

A vacuum boiler and syrup metering unit which can deal with 70 lb. of cooked toffee base every 3 to 4 min.

Packing

The packing rooms are air conditioned and receive the bins of wrapped sweets from the wrapping rooms, and the jellifruits and marshmallows from the starch rooms, on moving conveyors. The full bins are removed from the conveyors and empty bins put on the return conveyors to go back to the wrapping rooms.

The bins are stacked on stillages and drawn from as required. Assortments are mixed on mixing benches by hand, according to requirements. We saw the prototype of a mixing machine which is intended to replace the manual process by an automatic one. The machine consists of a circular hopper divided into a number of segmental compartments, each containing a different kind of sweet. By means of an automatic gate device at the base, selections can be made from the various compartments and fed to a moving conveyor which has a series of baffles to ensure thorough mixing.

Packing is done mainly by hand, by women who weigh the various lots of sweets into jars and tins. Cartons of sweets for retail are packed by women who sit on either side of a conveyor and select the sweets from it. It is a rule in the packing department that jars must be kept inverted except during actual filling, to minimise the risk of entry of foreign matter.

A certain proportion of all the sweets are sampled for inspection. records are kept of how much is inspected, what lines are inspected, and the faults found, if any.

Washing and storage

The washing department is equipped with four washing machines, two Dawson machines and two made by James Pascall, Ltd. These deal with the returned empty jars and tins used for despatching products to distributors. Damaged tins are, when possible, repaired on special rubber jigs which hold the tins while dents are knocked out with a rubber hammer.

The large warehouse has a storage capacity of about 900 tons of packed goods. The goods are stored on pallets, and extensive use is made of electric fork lift trucks of various makes. Part of the warehouse is air-conditioned; in this section are stored packeted goods, chocolate lines and goods for export.

For nearly a hundred years, James Pascall, Ltd., have been manufacturing high-quality sweets, including chocolate lines which are outside the scope of this article. Although the present factory at Mitcham goes back to 1902, a policy of continual improvement and the use of the latest machinery makes it one of the most modern sweet factories in the country, which has an established place among the leaders of the confectionery industry and of whose achievements the firm can be rightly proud.

Suppliers of Machinery and Equipment

W. and T. Avery, Ltd.
Baker Perkins, Ltd.
Barnsley Canister Co., Ltd.
Bramigk and Co., Ltd.
J. Collis and Sons, Ltd.
Conveyancer Fork Trucks, Ltd.
Dawson Bros., Ltd.
Hansella Machinery and Packaging, Ltd.
A. Jenner and Co., Ltd.
Lansing Bagnall, Ltd.
The Metal Box Company, Ltd.
Redler Conveyors, Ltd.
Rose Brothers (Gainsborough), Ltd.
Winkler and Dünnebier.

An artist's impression of the factory, showing, left, the administration block, and right, the tower housing storage tanks and boiler chimney.

Campbell's Soups' New Factory

First British plant opened at King's Lynn

We recently went to see canned soup in production at this modern plant in Norfolk, which began operations in June. Employing 400 people, it has been designed and equipped by British firms.

WELL known on the American continent, Campbell's canned soups have been scarce in this country since wartime and post-war restrictions curtailed dollar imports. To rectify this state of affairs, Campbell's Soups, Ltd., have built a soup preparation and canning plant at King's Lynn to make its products once again obtainable on the British market.

No amount of questioning would persuade Mr. R. H. Beeby, the bland, dapper Philadelphian who directs operations at King's Lynn, to reveal the size, cost and output of the new factory. "Adequate," was his dry answer, with which his questioners had to be content. But we learnt that the present labour force is about 400 and still increasing, and that the many-acre site on which the plant is built gives ample scope for future expansion.

In pleasant, rural surroundings on the outskirts of the town, the appearance of the plant is modern and functional. A tall, square glazed tower dominates the production building, noteworthy by being the first, so far as is known, to combine in one structure the boiler flues, the water and oil storage tanks, and the electrical switchgear. Inside, skilful pastel colour decorations enhance the brightness of extensive glass surfaces but do not obtrude. No cost has been spared to furnish the administration block, which is separated from the main plant by a long glassed-in corridor, in a style of sumptuous efficiency.

Varieties

At the present time, seven varieties of soup are being made —bean with bacon, green pea, vegetable, cream of chicken, cream of mushroom, chicken with rice, and Scotch broth. The general scheme of manufacture is as follows: ingredients (vegetables, poultry, cereals, etc., are weighed, sorted, prepared and cooked, then the soup batches are assembled in the blending kettles, filled into cans, sterilised, labelled and packed.

Three stores—a cold store, a freezing store for meat and poultry, and a store for dry ingredients—provide accommodation for raw materials and materials in process; vegetables go to a sorting room where they are graded, washed and peeled by automatic peeling machines; meat goes to the butchers' shop for cutting up; and poultry to the preparing room where it is washed and cut up. At this stage most of the work is done by hand, because the cutting and trimming of a chicken carcase, for example, could hardly be done otherwise. The ingredients having been given a preliminary preparation then go forward to the general preparatory area where women sitting at preparing tables give the final finish to vegetables and trim the pieces of chicken, mutton, etc.

Processing

Chickens after preparation are cooked in cooking tanks, of which at the present time there are 8, although this number is to be increased. The chickens are placed in baskets which are conveyed to the tanks and lowered into them by means of overhead hoists. Extraction of the chicken bones is carried out in digesters. In this department are mincing and dicing machines; after being diced, the cubes of meat are put through a screen to separate the fines. In this connection, it is interesting to note that great care is taken to ensure not only that the soup batch contains the specified weight of diced meat, but that each can, in fact, contains the correct number of cubes of meat. The diced meat is sorted and inspected, and any gristle removed, after which it is conveyed over a magnet to eliminate the possibility of any metal going through the process.

Also in this department is a washing machine for cleaning the various buckets and containers.

Vegetables come from the preparing area by conveyor; peas and beans go to a sorting machine, other vegetables traverse a sorting belt, after which all go to a mincing machine and then over a magnetic checking machine before being collected in a weighing bin.

Workers are seen putting ingredients into the blending kettles under the watchful eye of a supervisor.

Blending of soup

All the prepared ingredients now come forward to the 16 blending kettles in which the soup batches are assembled and mixed. Each kettle is fitted with a stainless steel hinged lid and exhaust cowl to take away steam and odours. All water used for processing is filtered. The contents of the blending kettles, when processing is complete, are discharged by gravity into mobile stainless steel pans, and pumped to the filling machines. Cans come from the can store to these machines by multi-channel overhead runways. The filled cans pass to clinching and seaming machines, and are then taken in baskets for sterilisation in a battery of 27 retorts. After sterilisation, the baskets are unloaded by hand, the cans are placed on conveyors and pass successively to labelling, case packing and carton sealing machines and are finally conveyed to the warehouse.

Meat being prepared in the butchers' shop.

Despatch

The company's products are despatched by both road and rail; a rail spur enters the warehouse and railway wagons can be brought right into the building and

A batch of soup being stirred in one of the steam-jacketed blending kettles.

loaded under cover. Fork lift trucks are used to load road and rail vehicles. In the warehouse is a mezzanine floor where empty cans are stored; these are fed layer fashion by means of long forks on to the conveyors which take them to the filling machines.

Other noteworthy points regarding the new factory are the grain sifting room, where barley, rice, and similar ingredients are graded; the boiler house containing three horizontal oil-fed boilers of advanced design (as already mentioned, the stacks from the boilers are housed in the same structure as the water and oil storage tanks); the laboratory where elaborate checks are made of all raw materials, materials in process and finished products; and the well-equipped maintenance shop.

Campbell's Soups, Ltd.'s claim that quality is their first consideration is well-founded; this, the first of their British factories, is a notable example of the advanced food factories now coming into being.

Some Suppliers of Equipment

Allen West, Ltd.: hoists.
Ashworth Ross, Ltd.: weighing machines.
W. and T. Avery, Ltd.: scales.
International Machinery Corporation: labelling machines.
Kelvin and Hughes (Industrial), Ltd.: instruments.
Leeds and Bradford Boiler Co., Ltd.: canning retorts.
Mather and Platt, Ltd.: digesters.
The Metal Box Co., Ltd.: filling and canning machinery, conveyors.
Metal Propellers, Ltd.: cooking tanks, blending kettles.
Thomas Robinson and Co., Ltd.: grain sifting machines.
Spencer - Bonecourt - Clarkson, Ltd.: boilers.
Varley-FMC, Ltd.: washing and peeling machines, case packers, grain sifting machines.
Walker, Crosweller and Co., Ltd.: steam mixing valves.
Yale and Towne Manufacturing Co., Ltd.: fork lift trucks.

▶ Markland Scowcroft, Ltd., have published a catalogue of some of the tubes, valves and fittings which they make. It incorporates a price-list and the firm's terms of business.

A booklet called *Plenty's Industrial Versatility* has been published by Plenty and Son, Ltd. The booklet is intended to show to potential and existing customers the full extent of the equipment made by the firm.

Food Research

THE eighth volume in the series of reviews of various topics in the food industry* includes reports concerning the functional areas of rheology, blanching, fermentation, and biochemistry, and the commodity areas of cereal grains, cacao, and pome fruits.

The rheological properties of foods are described as extremely important in the determination of quality and acceptance: G. W. Scott Blair of the National Institute for Research in Dairying, University of Reading, the author of this chapter, defines rheology, explains its concepts, discusses relevant processing, manufacturing, and processing problems and considers the importance of rheology to the consumer. Despite the fact that comparatively little has been written on the subject, over four pages are devoted to references in this chapter.

Dr. Frank A. Lee of the New York State Agricultural Experimental Station, Cornell University, is the author of the section on the blanching of fruit and vegetables. Apart from reviewing some of the literature dating from World War II on the subject, the effects of the different techniques of blanching on the various components of the processed materials, various blanching procedures and some of the changes which occur when unblanched tissues are held in frozen storage are discussed.

The unique and little understood process of fermentation of cacao beans suffers from the fact that most of the literature on the process is widely scattered and hardly available to the average man. A comprehensive survey of the matter is given by P. A. Roelefsen of the Laboratory of General and Technical Biology of the Technical University, Delft, Netherlands. Discussed are the essentials of the methods used in the processing of cacao, the histology of the cacao seed, the organisms involved, and external and internal fermentation characteristics.

* *Advances in Food Research*. Vol. VIII. Edited by E. M. Mrak and G. F. Stewart. Pp. xii and 437. Academic Press, Inc., New York. $12.

Impressions of KITT GREEN

H. J. Heinz Co.'s £7 Million Factory near Wigan

Opened last May, the largest food factory in the British Commonwealth is now in full production and turns out half a million cans of Heinz varieties a day. FOOD MANUFACTURE recently visited the factory and took these exclusive pictures.

IN spite of its size (it covers an area of nearly 10 acres) the layout of this enormous factory is easily grasped. Three separate blocks house the main factory, the can-making plant and the administration offices, while separate again from these is the boiler plant (the two boilers are in the open) with its two tall chimneys, and the water treatment plant. The main factory, walled on three sides by glass, is constructed sandwich-fashion; upper floor (processing) and lower floor (filling and packing) are separated by a mezzanine floor housing service installations and pipes, and workers' rest rooms and lavatories. Skilful use has been made of the lie of the ground; on the unglazed fourth side of the main factory block are the brick-enclosed warehouse and store rooms, and higher ground here has been used as the approach to a ramp from ground level to upper floor, where lorries discharge their loads. In winter this ramp is heated to prevent dangerous icing.

Inside the factory there is very little to be seen of food. A very high degree of automation ensures the very minimum of handling, and materials in process travel through the various stages to a large extent unseen. The size of the totally enclosed processing machinery and conveyors and the relative fewness of operators (one wonders where they all are, yet 2,000 are employed) impart a deceptive atmosphere of languidity, an illusion which is dispelled, however, by a visit to the can-making plant, where cutting, rolling, seaming and stamping machines prepare the various sizes of can, half a million of which are needed daily. The cans are conveyed to the factory by an elevated enclosed runway housing eight channels; cans travel upright on moving cables, an arrangement which is gentle on the cans and obviates the risk of seams being damaged through rolling.

(Above): **A view of the main factory building and elevated can runway, from the boiler plant.**

The Heinz variety made in the largest quantity is baked beans, and a large section of the factory is devoted to plant for this product. One of the types of bean used is the Michigan pea bean, obtained from North and South America. Although in season only

for part of the year, it stores well, and sufficient can be stored for year-round operation of the plant. The process involves the customary grading, washing, blanching and cooking; the tomato sauce is made separately and added during the filling. A notable feature are the colour sorting machines, used by Heinz in all their factories, which examine photoelectrically every individual bean and which reject discoloured ones, all at the rate of a million beans every two minutes. Other processing sections of the factory are the soup preparation, poultry handling, baby foods and vegetable preparation sections.

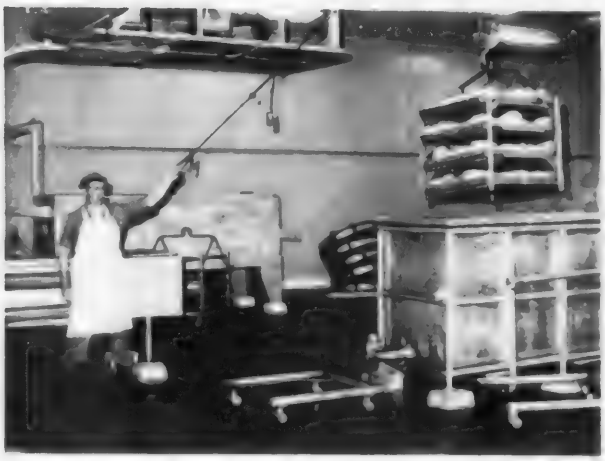
It is intended eventually to transfer to Kitt Green all the manufacturing and canning operations now carried on at Heinz's other neighbouring factory at Standish, and when this has been done the number of people employed at Kitt Green will be about 3,000. With an eye to future expansion, generous scope has been allowed in the factory plans for extensions.

Some Suppliers of Equipment

Acalor (1948), Ltd.
Babcock and Wilcox, Ltd.
E. W. Bliss (England), Ltd.
Dewey and Almy, Ltd.
Foodtech, Ltd.
Robert Kellie and Son, Ltd.
Mather and Platt, Ltd.
The Metal Box Co., Ltd.
Metal Propellers, Ltd.
Mitchell Engineering, Ltd.
Mono Pumps, Ltd.
Permutit Co., Ltd.
Purdy Machinery Co., Ltd.
Realm Engineering Works, Ltd.
Henry Simon, Ltd.
Smiths Insulations, Ltd.
Varley-FMC, Ltd.
Isaac Webster and Sons, Ltd.
J. C. Wetter and Co., Ltd.

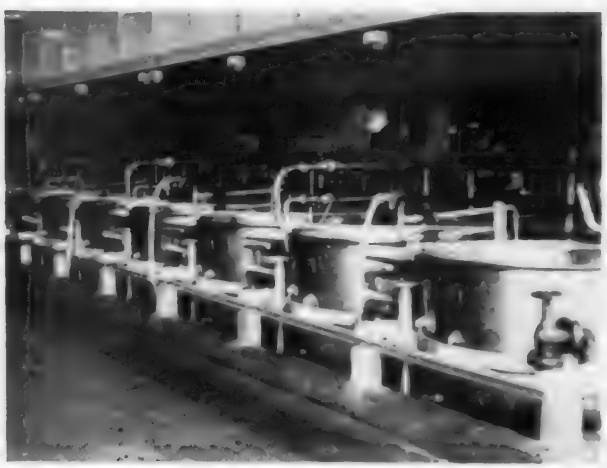
PICTURE REPORT ON OPERATIONS AT KITT GREEN

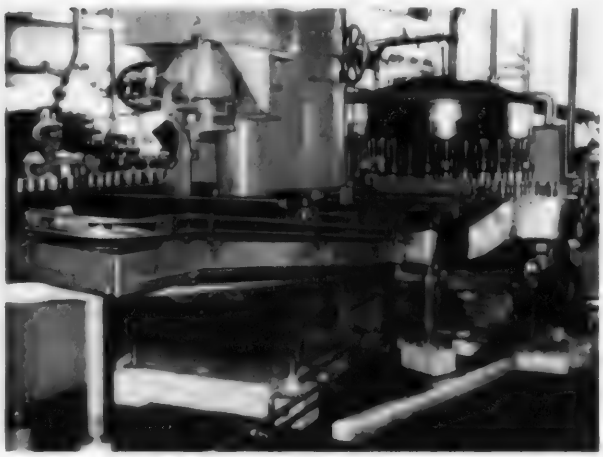
Chicken Soup



Chickens being hoisted from the washing tank.

These women separate the meat from the bones.



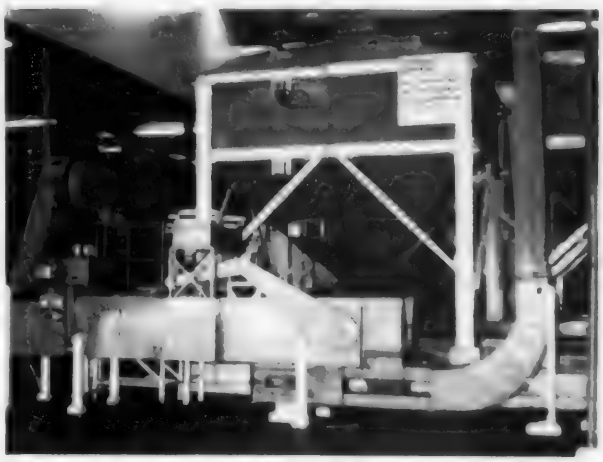


(Above): **A battery of stainless steel steam jacketed kettles in which soup is made** *(Right)*: **In the filling department on the ground floor. One of the many filling machines which fill soup into cans.**

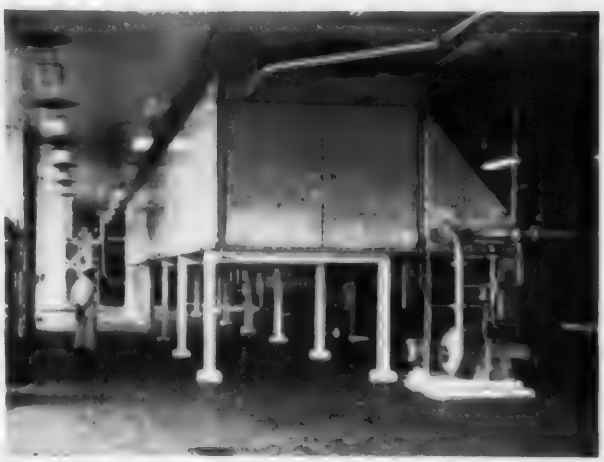
Baked Beans—From Sack to Can

After being emptied from sacks into hoppers, the beans are conveyed to these grading machines, which sort the beans and automatically reject those which are under or oversize.

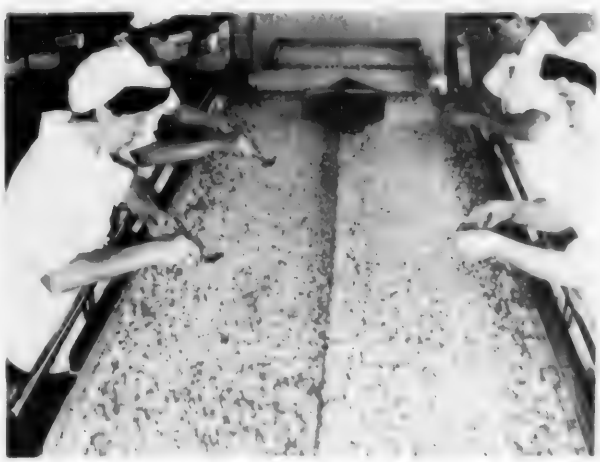
After being graded, the beans pass through a battery of electronic sorting units which examine each individual bean and reject those which are discoloured. Each unit is removable.



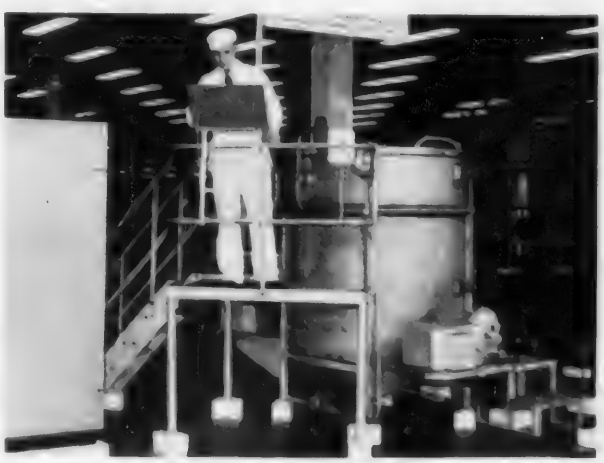
After electronic sorting the beans pass to these storage hoppers from which they are drawn to be weighed and washed.



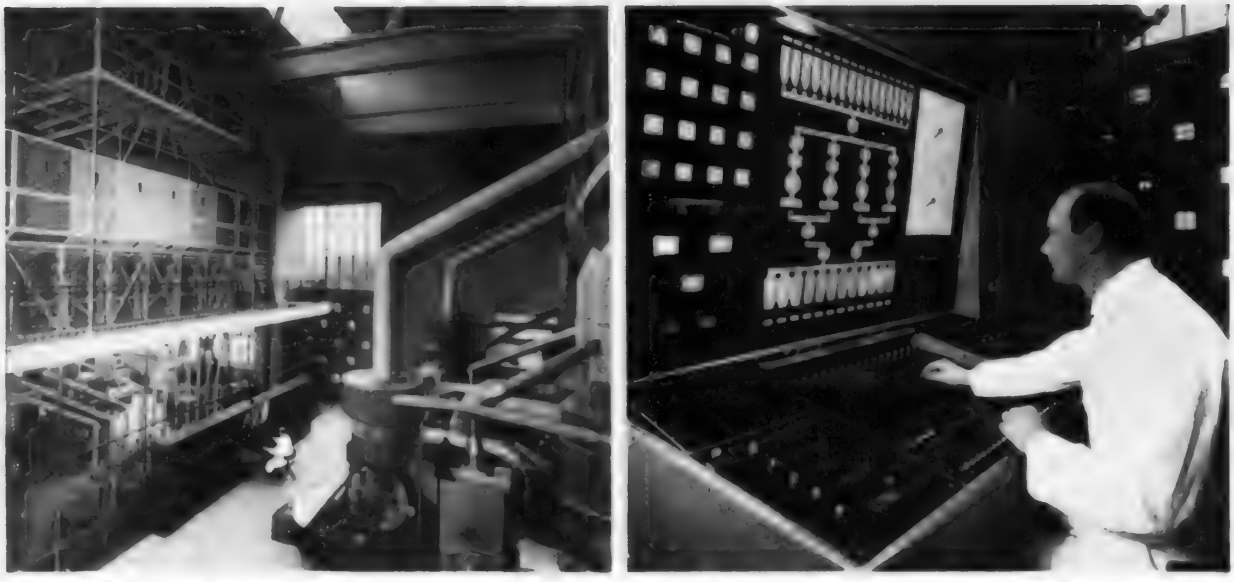
This picture shows the blanchers in which the beans are precooked after being washed. Blanching is by hot water.



One of the few points in the bean line where beans are actually visible; final inspection as they pass on a vibrating conveyor.



The mixing tank in which the ingredients for tomato sauce are blended before passing to the cookers.



The automatic coffee plant operated by Hakonbolaget at Västerås. *(Left)*: **General view.** *(Right)*: **A close-up of the control panel.**

HAKONBOLAGET

Automatic coffee plant

Recently visited by our Founder and Chairman, Mr. W. Leonard Hill, who brought back these pictures, Hakonbolaget's automatic coffee plant at Västerås in central Sweden is claimed to be the most modern in Europe.

FOUNDED in 1917 by Mr. Hakon Swenson (who retired from the position of manager in 1949), Hakonbolaget is a marketing organisation with a membership of about 4,000 independent traders, each of whom is a shareholder in the company (no shareholder may own more than 1½% of the total stock). The company's activities are spread over 28 distribution centres in central Sweden, each centre consisting of an office and store. Headquarters is at Västerås, where is situated what the company claims is the most modern coffee roasting plant in Europe and the first to be operated by electronic controls, which processes 20 tons of coffee a day. The main groups of commodity handled by the company are: fruit, vegetables and deep-frozen foods; groceries; hardware; and textiles. Besides purchasing its goods from Swedish and overseas suppliers, the company also processes certain proprietary brands, among which are *Corona* oatmeal, *Luxus* coffee, tinned herring and fish of all kinds, spices, tea, vinegar, fruit juices, biscuits, confectionery and chocolate, and tinned fruit.

The remote controlled electric radio truck illustrated is one of two operated by the company, claimed to be the first, if not the only ones, in Europe.

This Barrett electric radio-controlled truck is remotely operated by means of a control box slung over the operator's shoulder.

Spontaneous Heating of Fish Meal—II

By C. J. H. van den Broek*

In the concluding part of this article, the author continues his review of the causes of spontaneous heating and discusses some preventive measures; proper stowage and ventilation are most important.

IT has also been observed that meal which has been overdried is more liable to develop spontaneous heating.[7] This could be explained by an over-"activation" of the meal leading to a more intense oxidation, but the explanation that such thoroughly dried meal is more hygroscopic seems equally possible. This point is further discussed under Section 6 (Moisture). It is finally surmised that great fluctuations in drying may be one of the causes leading to spontaneous heating of fish meal during storage.[2]

Higher peroxide values are also found in fat from meal conveyed pneumatically from the dryer to the storage house than in meal which is bagged straight from the dryer.[2] Apparently, during pneumatic transport the oxygen is brought into a more intimate contact with the meal.

Evidently, oxidation will be facilitated when the meal is finely divided. Thus, unmilled meal cures at a slower rate than milled meal at all stages of storage. When unmilled meal is milled after prolonged storage, milling does not result in a markedly increased rate of heating.[17]

The statement by Flood[18] that the danger of spontaneous heating will increase if the raw material (*i.e.* herring) is not well cooked during processing, could perhaps be explained by the fact that such insufficiently cooked scrap cannot be thoroughly pressed out and therefore retains more oil.

If heat may be an "activating" agent during processing, the effect of heat on dry meal seems to be entirely opposite. When Kyte[4] reported that herring oil held on an inert support at 180°F. (80°C.) for 4 hr. showed no tendency to heat spontaneously, this could still be regarded as the outcome of complete fat oxidation. But recently Dreosti and Rowan,[17] in an experiment directed to other purposes, re-dried meal at 158°F. (70°C.) in a current of dry carbon dioxide, and again the meal thereafter showed a much decreased rate of heat production.

Also, meal, which was first brought to 122°F. (50°C.) in a nitrogen atmosphere and then was allowed to heat spontaneously in oxygen to 156°F. (70°C.) in 6 hr., showed a rate of heat production of only 30% of the not pre-heated control.[17]

These findings, they report, are corroborated by the experience of a factory manager, who said that he could stack his fish meal immediately after heating it to approx. 160°F. for about 4 hr.

There are other indications that chemical changes in fish meal at higher temperatures may be markedly different from those at lower temperatures.[27] Olafsson thought that peroxides are destroyed at higher temperatures.[2] It is thought possible that a relatively short period curing at an elevated temperature (perhaps even in the absence of oxygen) might be possible. Indeed, if these first indications are substantiated by further experiments and lead to practical application, they may become of great value to fish meal producers.

6. Moisture

Besides oxygen as an immediate factor in heat generation in fish meal, moisture appears to play a very important role. There is a difference, however, between these two factors, in that the importance of oxygen for creating heat seems to be more or less specific for fatty fish meal, whereas the importance of moisture appears to be found in a like manner in other dry goods.

It is certainly not without good reason that "according to the rule of the British Ministry of Transport for the carriage of substances liable to spontaneous combustion, fish meal carried in *jute bags* or in double-walled paper bags must contain *at least* 6% *and not more than* 12% *of moisture*. Fish meal containing less than 6% or more than 12% of moisture must be contained in hermetically sealed metal-lined boxes or in air-tight metal containers. The basis for the above moisture limits is not stated, but they are presumably related to practical experience. It is noteworthy that the National Fire Protection Association in the U.S.A. gives the same moisture limits for the storage of bagged fish meal and, moreover, state that the meal is dangerous when overdried or if packaged when over 100°F. (38°C.) in temperature."[7]

Flood[18] says that hard-dried meal with a low content of water shows a greater tendency to spontaneous heating because until equilibrium is reached it will absorb more moisture from the surroundings and at a high rate. For the same reason, whole meal, which contains more salts and solubles and is therefore more hygroscopic, takes up more moisture from the air.[10]

Experiments on the influence of moisture were first made in 1950 by Dreosti,[8] who artificially increased the moisture content of cured and therefore "safe" pilchard meals to 14% and 22%. Rises in temperature inside the stored bags occurred not only immediately after wetting (*i.e.* in

* University of Utrecht, Holland.

12 hr.) but again after about 6 days.

A similar experiment was done by the British Fire Protection Association.[7] A 140 g. sample of fish meal was moistened to a moisture content of 20% and stored under heat insulation at 78°F. (25°C.). The temperature was approximately constant for 4 days, then rose to 108°F. (43°C.) in 24 hr. and thereafter fell slowly. The corresponding graph is presented in Fig. 5.

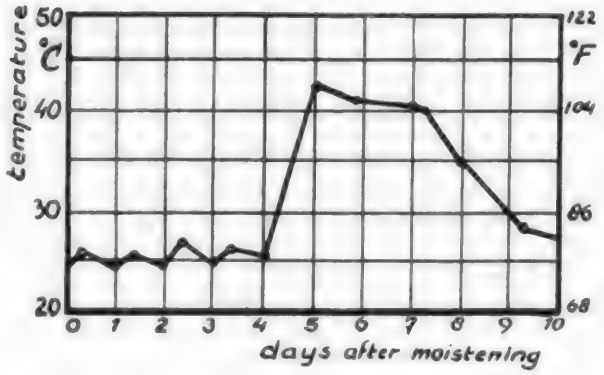


Fig. 5. Temperature increase caused by growth of micro-organisms in moistened fish meal sets in after a time lag of four days. (*After Bowes.*[7])

Lewis[19] noticed how fluctuations of the relative humidity in the store room caused corresponding slight fluctuations of temperature in the meal stored there inside jute bags. The same immediate response of stored fish meal to the relative humidity of the surroundings is quoted by Sparre and Arnesen,[6] who daily determined the moisture content of fish meal and found that the onset of moist weather was, within one day, followed by an increase in moisture content of the meal. Stander even demonstrated day-to-day fluctuations of the outer layers of meal in jute bags along with the ambient relative humidity.[28]

The effect of moisture was also clearly demonstrated in a controlled shipment of fish meal from South Africa. A number of bags had become wet because of rainy weather at a first port of discharge; when unloading was resumed at a second port a few days later, these bags had reached a temperature of 110°F. (44°C.), whereas adjacent bags and even the dry parts of the same bags were at an average temperature of 72°F. (23°C.).

These observations convincingly show the very striking and prompt response of fish meal to moisture. Although in other respects details of the process may not appear to be sufficiently known, it seems possible to arrive at the following picture:

(*a*) Fish meal, unless protected by a moisture-proof barrier, very rapidly takes up moisture from the surrounding air; the more so the drier the meal is or the more water-soluble contents it has.

(*b*) The uptake of moisture by the meal can, first, be accompanied by an *immediate* increase in temperature (as found by Dreosti but not by the Fire Protection Association). This temperature rise, occurring so promptly, cannot be ascribed to the growth of micro-organisms and must have been caused by chemical action. The different behaviour of the meal in these two experiments might perhaps point to the fact that these meals were not strictly comparable; Dreosti's meal, supposedly obtained from a near-by producer, may have been fresh and still capable of chemical action, whereas the meal used by the F.P.A. may have been older.

(*c*) Once the meal has taken up moisture, conditions are set for the growth of bacteria and moulds. According to Shewan,[29] microbial growth in dehydrated fish can occur as the moisture content exceeds 10% and becomes dominant at a moisture content of 20%. According to figures from Lewis, 16% moisture in the meal can be considered just inside the possible growth range.[17]

The biochemical activities of these micro-organisms cause a rise of temperature that may be of much longer duration than the one under para. *b*. This temperature rise was found by Dreosti to occur after a time lag of 6 days and, independently by the Fire Protection Association, of 4 days (see above); the occurrence of such a time lag is familiar to anyone having knowledge of microbial processes.

Bowes[7] remarks: "The behaviour of the temperature in the meal is similar to that encountered in moist vegetable matter that is undergoing spontaneous heating through microbiological activity. In moist vegetable matter it is possible for the temperature to rise to about 167°F. (75°C.) as thermophilic bacteria become active . . ." and explains why his own test was of too small dimensions to find out whether similar temperatures could occur in fish meal.

It may still be possible that moisture, besides enabling microbial growth, interacts in some way with the chemistry of fat oxidation or other chemical processes involved in heating. When, however, Dreosti and Rowan[17] moistened pilchard meal to either 10% or 16% moisture, no significant change was found in the heat production. It may be noted that these tests were made well within the microbial time lag, so that "bacterial heating" could be ruled out. Hence, at present there is no clear indication of any such interaction.

7. The causes of spontaneous heating

(*a*) The *normal spontaneous heating* occurring immediately after fish meal has left the drying apparatus can with almost complete certainty be ascribed to the oxidation of the fat or a certain portion of the fat in the meal. The oxidation being exothermal, heat is produced which, if not instantly and effectively removed, causes a temperature rise, which in turn leads to an acceleration of the oxidation process. Thus, in the centre of a mass or stack of fish meal of suitable dimensions, very high temperatures can be reached.

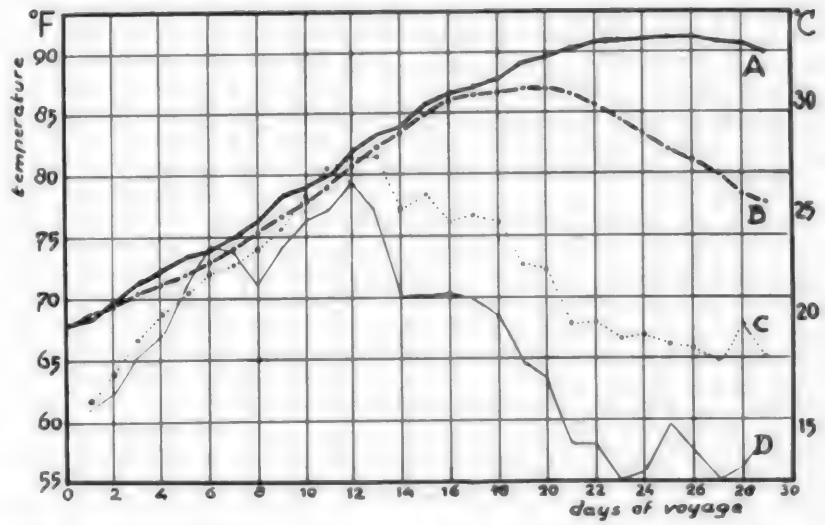


Fig. 6. Temperature changes in a shipload of fish meal during a voyage from South Africa to Europe. A—bags of meal stacked in large blocks; B—bags of meal stowed in athwartship strips; C—air temperature at the top of the load; D—ambient temperature. (*After Lewis.*[24])

(*b*) *Accidental spontaneous heating* can have two different causes, *viz.*:

(i) Delayed oxidation of the fat (chemical heating). In meal which is not sufficiently "cured," *i.e.* in which the fat is not fully oxidised immediately upon production, such an oxidation may take place suddenly during storage or transport. The immediate cause of the oxidation reaction starting is often difficult to give, but it could be started by a (slight) temperature rise caused by some other factor. Once started, the heating will take essentially the same course as under para. *a*.

(ii) Growth of micro-organisms caused by moisture. After a lag time of some 4-6 days microbial growth sets in, causing a temperature rise if the mass or stack of meal is of such dimensions that heat dissipation from the centre is insufficient.

At higher temperatures special thermophilic bacteria step in which, working in succession, can raise the temperature to about 167°F. (75°C.).

As the fat in the meal is not essentially involved in the growth of micro-organisms, *microbial heating* can occur in any kind of meal, independent of the degree of curing, even in completely cured meal.

8. Probability of ignition

As already stated, it is generally accepted that the heating, caused by fat oxidation, whether normal or accidental, can in extreme cases lead to ignition. Numerous literature citations to that effect have been presented under I, 3.

As to microbial heating, it is not altogether certain that ignition can eventually ensue. Bowes[7] is inclined to make a comparison with the microbial heating in moist vegetable matter, which stops at about 167°F. (75°C.), because then the thermophilic bacteria are killed by the temperature produced by their own action.

In the case of fish meal, the situation is different from vegetable matter, in so far as there is a large quantity of fat present. It is thought reasonably likely that an oxidation of even "cured" or almost "cured" fat may be started at the higher temperature evolved by the micro-organisms. Most chemical reactions proceed 2 to 3 times more rapidly for every 10°C. temperature increase. Normal storage being around 15°C., a temperature rise to 75°C. would mean an acceleration of the oxidation of 2^6 to 3^6, *i.e.* 64 to 729 times!

In reality, such acceleration would hardly be found. Some heating curves obtained by Dreosti and Rowan[17] indicate much smaller temperature coefficients of reactivity. Nevertheless, for many types of meal, in which at normal temperature the rate of heat production would be so small that the excess heat can easily be dissipated (such meal would appear to be completely "cured"), heat dissipation could clearly become insufficient at a rate of heat production many times as great. This view is also expressed by Lewis:[25] "wetting of the meal can lead to microbial activity resulting in the elevation of the meal temperature to a point at which oxidation proceeds at an accelerated rate."

Attempts to ignite small quantities of fish meal with a small flame[7] have been unsuccessful, and show that ignition of fish meal by an external source is likely to be far more difficult than it is for other granular materials such as sawdust. This small-scale experiment cannot, however, be compared with the situation inside a large mass of fish meal where, owing to lack of ventilation, fumes have accumulated during heating. It is thought possible that the heated centre of a mass of fish meal can for a rather long time remain on the verge of ignition and that a fire can be started, *e.g.* as soon as, by breaking up the mass, an ample supply of oxygen becomes available.

III. Measures to Prevent Spontaneous Heating

Since normal spontaneous heating has for many years been known to occur, producers of fish meal have long since developed certain practices for air cooling of the meal immediately after it has left the dryer. Such measures were described by Harrison in 1939:[3] "the meal is never shipped immediately after production, but is either spread in a thin layer on the floor for 24 to 48 hr. before being ground to meal or it is ground immediately and the bags are set in the floor in minimum contact with one another and allowed to stand 24 to 72 hr. be-

fore being tightly stowed in piles or loaded for shipment."

The rather frequent occurrence of damage due to heating of fish meal has induced the Fish Industry Research Institute of South Africa to publish a set of rather strict recommendations for the treatment of such meal both upon production and during shipping.[26] The effects of these recommendations have since been systematically investigated.

From these and other investigations a number of interesting indications may be gleaned for the treatment of fish meal:

1. At the site of production

The addition of antioxidants has markedly reduced the tendency for spontaneous heating in some cases,[4, 5, 21] but not in all.[17] It would seem that the economic feasibility of such treatment would have to be very carefully studied for every case, and a possible after effect (*e.g.* increased heat generation at elevated temperatures) should be borne in mind.

The possibility of a short-time heat treatment to prevent spontaneous heating has been indicated,[17] but its application must await further research.

Packing meal very densely does not make any significant difference to the rate of heating,[5, 17] and a preliminary experiment with a carbon dioxide atmosphere did not reveal any inhibiting effect of this gas on heat generation.[16]

All bags of meal must immediately be clearly marked as to date of manufacture and the different days' production must be kept separate, so that no insufficiently cured bags will be shipped along with cured batches.[30] Immediately after bagging the fish meal should be stacked upright in single rows to allow ample ventilation. After 24 hr. the bags may be palleted, but stacks should not be higher or broader than 6 ft., and ample space should be left between stacks for ventilation. Temperature inside the bags should be taken repeatedly, and any stacks exceeding 140°F. (60°C.) should immediately be broken down and not be restacked until inside temperatures have reached 120°F. (50°C.). After a further 48 hr., stacks may be increased to a height of 12 ft. If piled in the open, stacks should be covered on top, but not on the sides, with waterproof tarpaulin.[26]

No bags of fish meal should be shipped until 4 weeks after production.

2. Awaiting shipment

Stacks of bags should be covered on top and along the sides with waterproof tarpaulin, because any bag loaded when wet is a hazard to the ship.[30] Of course, such canvas covering will reduce the dissipation of heat,[31] but as no bags other than those containing well-cured meal must be shipped, the danger of wetting from the outside is far greater than that of inside heat generation.

The entire load should be carefully inspected before shipment, and all bags having a temperature above 100°F. (37°C.) or showing signs of lumping or scorching should be rejected.

3. During shipment

An adequate and continuous ventilation of all ships' holds carrying fish meal is of prime importance. Ships' ventilators are stated to be at present grossly inadequate.[8] The danger of providing partial ventilation should be recognised; in such cases a situation may well arise where enough oxygen is provided to keep the oxidation of the fat going, while the amount of air is insufficient to carry away the heat generated by this process. Thus, *poor ventilation is far worse than no ventilation at all!*

After investigation of the case of two shipments of Cape Town fish meal to Europe, in which bad heating was encountered,[11] a F.I.R.I. official supervised another shipment[23] in which, by shipping only well-cured meal, carefully handled beforehand, good ventilation all through the load, and regular temperature measurements throughout the voyage, all meal was discharged in excellent condition, although the voyage was longer than expected.

As a result of these studies a set of recommendations was evolved[6] and subsequently revised[26] in which several alternative methods of stowage of fish meal on board were suggested. Two of these were subsequently tried out in another shipment of South African pilchard meal,[24] *viz.*:

(*a*) *athwartship-strip stowage:* two-bags length stacks were built running athwartships from starboard to port, with a 4 in. air channel in between, so that each bag had one end exposed to an air channel;

(*b*) *Vertical air shaft stowage:* large stacks were built on 6 in. dunnage and with vertical air shafts 30 × 6 in. spaced at regular intervals in the stack.

These ways of stowing were compared with stowage of the same meal in large or small stacks without inside ventilation. The experimental stacks reached their maximum temperature about 5 to 8 days earlier than the conventional stacks, and although, in some cases, the actual *maximum temperatures* were not significantly lower, the *average* maximum *temperature rise* in the experimental stacks was in every case significantly lower statistically than that of the conventional stacks. The same held for the average final temperatures before discharging. An example of some temperature curves is given in Fig 6.

Although both athwartship-strip stowage and vertical air shaft stowage proved to be highly efficient in reducing heating of the meal, the first method was preferred for practical reasons.

For further details the interested reader is referred in particular to the publications of the Fish Industry Research Institute of South Africa, whose research into the subject has been on a large scale. At present, much of the chemistry of spontaneous heating is still obscure, but research may lead to closer understanding; meanwhile danger may be eliminated by following the institute's fairly simple rules.

(Concluded on page 396)

Machinery for making JAM

FOOD MANUFACTURE's up-to-the-minute guide for manufacturers contemplating re-equipment.

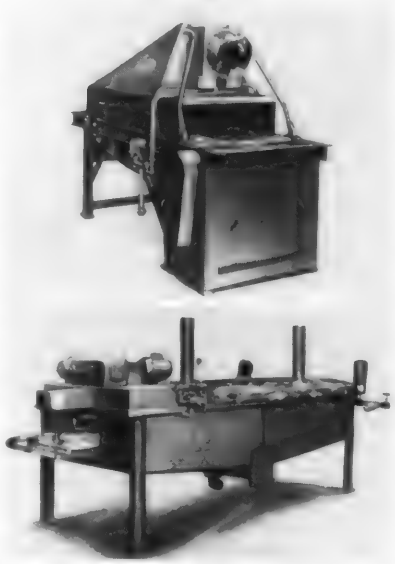
Processing equipment

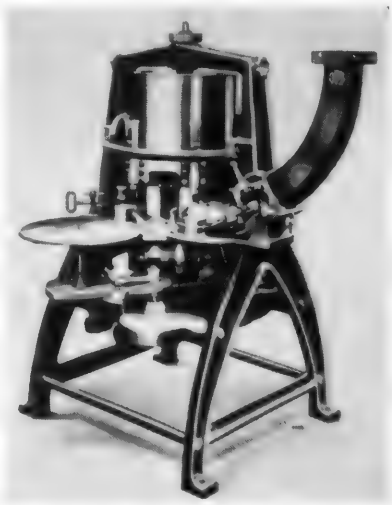
EVAPORATORS suitable for the continuous boiling of jam are among the products of the Kestner Evaporator and Engineering Co., Ltd., who say that these plants are applicable to both heat-sensitive and non-heat-sensitive liquors. Their method of operation is as follows:

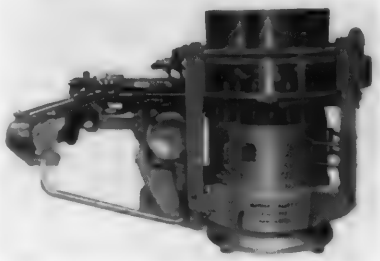
Weak jam liquor is made up from weak pulp, sugar and water together with any other additions for the adjustment of *p*H and the amount of pectin present. After steeping to dissolve all the soluble materials, this liquor is fed to the evaporator feed tank where it is agitated. The feed passes through a pre-heater to the base of a *Serpentine* evaporator; boiling takes place in the tubes, and because in these it is present in the form of a film, the liquor passes very rapidly through the evaporator and is concentrated in a single passage. The concentrated liquor leaving the evaporator is ready for canning or bottling.

Advantages claimed for this evaporator are its continuous operation, very short time of contact between liquor and heating surface, atmospheric working pressure because of the film principle, simplicity of operation (apart from a feed pump there are no moving parts), heat recovery from the condensed water, and small space requirement.

Clarke-Built, Ltd., say that their specially designed continuous cooler for pulps and jams has proved very satisfactory for taking the jam direct from the boilers and lowering the temperature to about 150°F. At this stage it is possible to take the product into large commercial containers without any risk of subsequent deterioration, which is normally caused by slow cooling. Jam's capacity to retain heat is high, and this causes problems when pulps and jams are packed hot into large containers, *e.g.* 28 lb. Resulting defects are often a bad "set," dark colour, and to some extent a spoilage of flavour, most noticeable in the centre of the container.







Mather and Platt machinery. (*Top, left*): a jar warmer which pre-heats glass containers with hot air. (*Top, right*): a 6 cylinder Universal filler which can handle jams, mincemeat and similar products. (*Bottom, left*): jam jar steriliser designed to receive filled and capped jars. (*Bottom, right*): 20-head high speed universal filling machine with a number of automatic features.

Equipment made by William Brierley, Collier and Hartley, Ltd., includes a jam cooling trough, which is water jacketed and is fitted with a slow moving stirrer, which is supplied in stainless steel or copper in various sizes, and which is claimed to afford simple but effective cooling with easy inspection; a stainless steel pressure cooker for peel softening; a stainless steel autoclave for fruit pulping, of 1 ton capacity, and fitted with steam and compressed air connections; a stainless steel peeling machine for apples, etc.; and a slicing machine with an output of ½ ton per hour.

A jam cooling trough made by Mather and Platt, Ltd., features a stainless steel semi-circular water cooled tank fitted with a hollow water cooled 4-bladed stainless steel rotating impeller. This design is claimed to ensure a rapid, controlled rate of cooling and, with whole fruit jams, to ensure that the fruit is evenly distributed throughout the product in the tank. Alternatively, by passing hot water through the paddle and jacket, the unit may be employed as a holding tank to prevent products settling prior to filling. The holding capacity is approximately 750 lb. of jam.

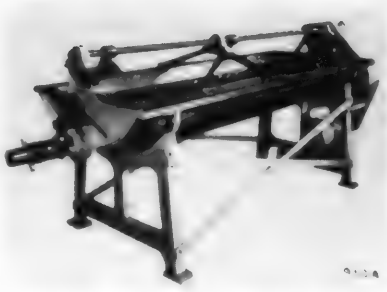
Pumps

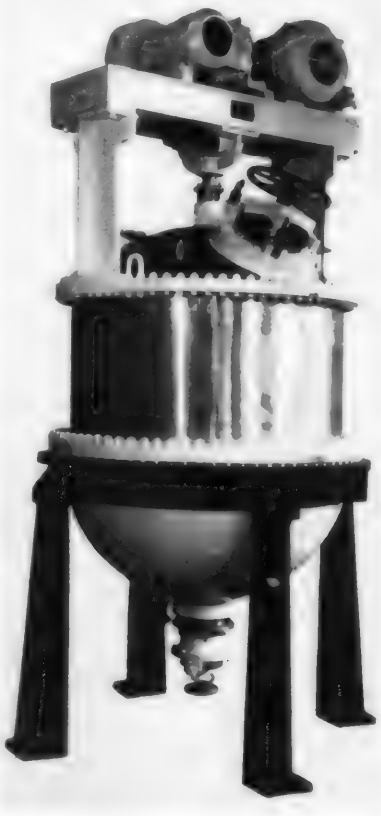
The Mono pump consists essentially of a single helical metal rotor which revolves in a resilient stator of double internal helix. When the pump is in operation, the rotor and stator engage in such a way that cells or chambers of uniform size are formed and are continuously travelling through the pump.

The makers, Mono Pumps, Ltd., say that a feature of particular interest to jam makers is the effective way in which it will pump jam containing whole fruit, such as strawberry, without damage to the fruit. The fluid velocity through the pump is low, and by means of a variable speed drive the pump speed can be reduced to suit the viscosity of the jam being pumped. The resulting flow is non-pulsating, and the proportions of a mix in preparation are not disturbed.

The pump is claimed to be capable of handling either hot or cold liquids and to have a steady performance when handling fluids of varying viscosities such as sugar syrup, pectin or gelatine. The makers produce a range of stainless steel pumps to cover all requirements for jams and preserves up to capacities of 7,500 gal. per hr. All these pumps are inherently self-priming, and the powerful suction makes for neat and easy installation. Cleaning and maintenance can be carried out by unskilled labour, the makers say. Pumps are available as static units for installation in the production line or as mobile units mounted on trolleys.

For the marmalade industry, W. J. Hart and Sons, Ltd., supply Waukesha sanitary pumps with an O-ring seal claimed to provide a simple and effective seal for both pressure and vacuum, and to be very cheap to replace. These pumps are claimed to have advantages such as the ability to deliver an accurate volume in a steady, non-pulsating flow, absence of aeration, no bearing or friction surfaces, and easy dismantling for cleaning. A feature is the balanced twin-blade impellor. This firm also supplies the





Two selections from the range of equipment made by Wm. Brierley, Collier and Hartley, Ltd. (*Top*): A water jacketed jam cooling trough with stainless steel or copper in various sizes. (*Bottom*): A stainless steel autoclave for fruit pulping, 1 ton capacity, fitted with steam and compressed air connections.

Hällde orange peel shredding machine type A-2. Fitted with a 1 h.p. motor, it weighs 70 lb.

Filling machines

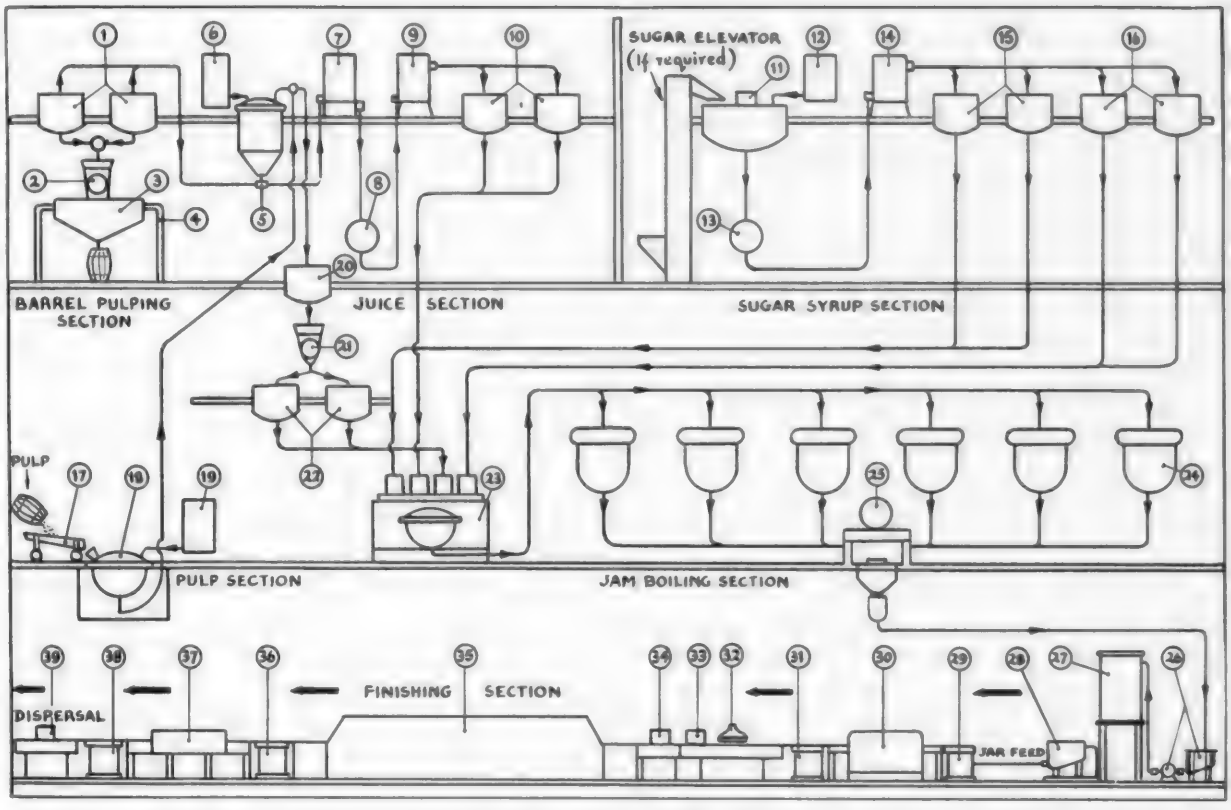
A rotary pump automatic filler made by Mather and Platt, Ltd., employs a "volume/time" filling principle; its particular feature is claimed to be the flexibility in size and shape of containers which can be filled, and both change of container-handling parts and adjustment of fill, say the makers, take only a few minutes. The positive displacement rotary pump features two intermeshing tooth segments which enable whole fruit or fruit containing stones to be pumped with the minimum of damage. All contact parts are quickly cleaned, and a photo-electric "no-can stop" device can be fitted to stop the machine if the jar feed fails. The nominal capacity is about 120 lb. of jam per minute.

Another Mather and Platt filler is the 6-cylinder universal filler, which may have advantages over the rotary pump filler with certain products and individual maker's requirements. Its volumetric filling principle employs 6 cam-operated pistons and plunger cut-off valves, and is claimed to minimise damage and spoilage of the appearance of the product. Synchronised link up and container transfer can be arranged with the sealing machine. Jar lifts can be incorporated to commence the fill inside the jar. The machine is supplied with a can chute or with a table feed for glass containers, and has a "no-can no-fill" device. Container speed is up to 120 a minute.

A high speed universal filler made by the same firm has a principle similar to that of the 6-cylinder universal filler, but incorporates a rotary cut-off valve, and as it has 20 filling heads the output is correspondingly higher. Similar features such as a built-in "no-container no-fill," automatic container feed and discharge, and synchronisation with the closing machine are available, together with positive adjustment of fill into the container.

Jar handling equipment

Mather and Platt also make a jar warmer and a jar steriliser; the jar warmer preheats glass containers which are fed on to a wire mesh conveyor and slowly carried through a current of hot air blown by a fan through a steam radiator unit. Features of the steriliser include a stainless steel conveyor, a lagged tank and easily removable



A New Jam Plant

This is a flow diagram of the recently completed jam, marmalade and jelly plant at the Acton, London, preserve works of the C.W.S., which was designed by Robert Kellie and Son, Ltd., who also supplied much of the equipment. The numbered plant items are explained in the key below, which for clarity is divided into sections.

Barrel pulping section

1. *pulp storage tanks;* 2. *pulping and straining machine;* 3. *pulp mixing tank;* 4. *platform for tank.*

Juice section

5. *calandria type autoclave;* 6. *water calibrating tank;* 7. *pulp filter press;* 8. *juice receiver and blow up;* 9. *juice filter press;* 10. *juice storage tanks.*

Sugar syrup section

11. *sugar melting and mixing machine;* 12. *water calibrating tank;* 13. *sugar syrup receiver;* 14. *syrup filter press;* 15. *sugar syrup storage tanks;* 16. *invert sugar storage tanks.*

Pulp section

17. *pulp inspection trolley;* 18. *pulp receiver and blow up;* 19. *water calibrating tank;* 20. *pulp receiving tank;* 21. *pulping and straining machine;* 22. *pulp storage tanks.*

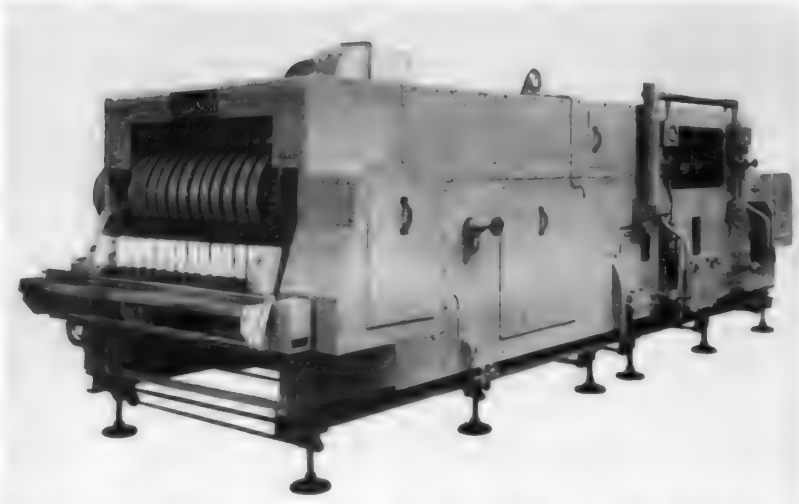
Jam boiling and finishing section

23. *pan charging unit;* 24. *rapid boiling pans;* 25. *off weighing unit;* 26. *jam pumping unit;* 27. *jam cooling tank;* 28. *jam holding tank;* 29. *rotary table;* 30. *jar rinsing and sterilising machine;* 31. *rotary table;* 32. *jam filling machine;* 33. *jar feed device;* 34. *sealing machine;* 35. *sterilising and cooling machine;* 36. *rotary table;* 37. *drying conveyor;* 38. *rotary table;* 39. *labelling machine.*

covers to reduce steam consumption to a minimum, automatic water mixing valve, and steam supply controllers, and a variable speed gear in the main drive assembly.

Dawson Bros., Ltd., supply many kinds of machines for the jam and preserve manufacturing industries; they say that standard machines can be tailored to suit individual needs or special machines can be made for any reasonable purpose. The makers say that all sizes of new or used jars, with or without labels, can be dealt with by their jar washing and drying machines in quantities from several hundred per hour to 24,000 per hour. The jars are carried through the machines in special containers, receiving as they go a searching internal and external high pressure jet treatment from batteries of jets above and below the conveyor. After this washing and rinsing treatment, the jars pass through a hot air drying section to emerge sterile and dry. This drying section is optional. If only new bottles are being handled, the machines can be supplied with a rinsing treatment only, with or without the drying section as required.

Dawson's washing and rinsing machines for filled jars wash and



A jar washing and drying machine with semi-automatic feed, and automatic discharge with a capacity of up to 7,200 bottles per hour, made by Dawson Bros., Ltd.

rinse filled and capped (metallic closure) jars prior to labelling. The jars are carried through the machine on a continuous moving woven wire conveyor belt, to receive an overall wash followed by a scalding rinse from batteries of jets. The heat provided by the rinsing treatment enables the bottles to dry quickly after emerging from the machine.

Can washing and sterilising machines are available with capacities of up to 500 and more cans per minute, for handling both empty and filled cans. The cans are fed in single line and are inverted prior to the rinse and turned back again on leaving the drying section. The treatment consists of a hot detergent wash and a scalding rinse, both delivered by powerful jets, followed by a hot air drying period.

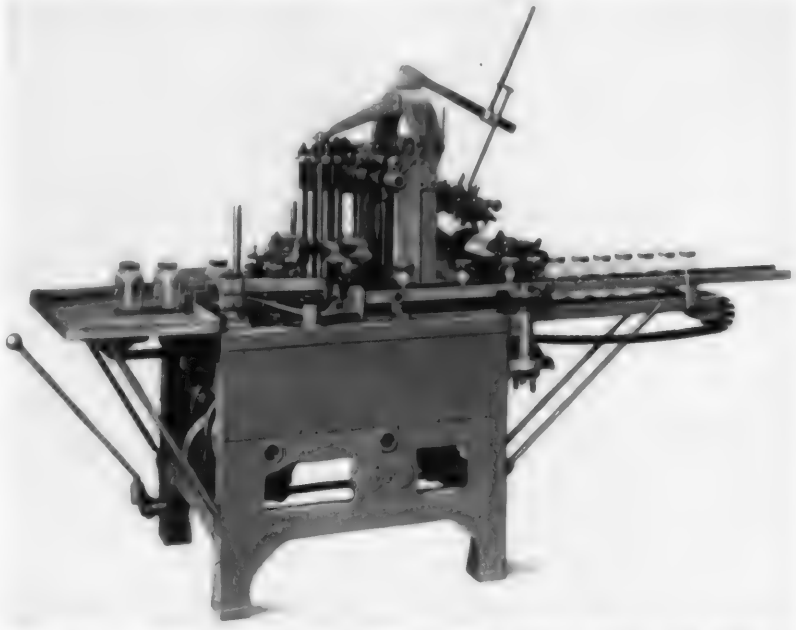
Dawson Bros. also make a wide range of machines to handle over 2,000 trays and utensils of all kinds per hour. The treatment given varies according to the type of items to be cleaned and the amount of cleaning required. A hot air drying section can be fitted if required. This firm also make machines to wash fruit and vegetables before processing.

The Thomas Hill Engineering Co. (Hull), Ltd., have recently introduced several new machines for cleaning almost any type of container, among which are the *Mayfair* single line automatic rinser which is designed for use where floor space is limited, and which has an output of up to 100 jars per minute (or more if modifications are made); the *Watford* air cleaner which dry-cleans with powerful air jets any type of wide-mouthed container at a rate of 150 per minute; the *Fastaclean* can cleaner which gives either wet rinsing or dry air cleaning treatment, and uses magnetic seating of cans to the slat conveyor to minimise risk of damage; the *Rotary-Air* cleaner which employs air jet and dust extraction heads instead of washing or rinsing jets; and the *Hot-Air* which is a dry air machine using hot air to dry containers that have just been washed.

Besides these machines, the firm make a wide range of other machines including the *Grangemouth* family for hydro cleaning or rinsing.

Labelling machines

Among the machines made by the Purdy Machinery Co., Ltd., of interest to the jam maker are the *Junior* semi-automatic labeller and the *Unimatic* labeller. The first is capable of outputs, on this type of application, of about 30 jars per minute, and is designed for edge-gumming the labels only. The makers say that it has been well tried and proved over a number of years and can be operated by unskilled labour. It is the smallest in the Purdy range; hand-fed and semi-automatic in operation, it is designed to apply one or two labels to round containers, where the label extends about half-way round the container.



The Purdy "Unimatic" labelling machine which applies labels of all shapes to containers of various shapes and sizes.

The *Unimatic* machine is fully automatic, capable of an output of up to 65 jars a minute. It is, however, fitted with a variable speed drive to provide a lower output if required. This machine gums the labels all over, and is fitted with feed and discharge conveyors and an accumulation table. Labels can be applied to any shape and size of container, and single or multiple label work can be accommodated. It has a " no-bottle no-label " device to cut out label delivery when a jar does not enter the machine; the operation of the machine itself is not interrupted, and labelling is resumed automatically when jar flow is restored.

The Grangemouth rinser made by the Thomas Hill Engineering Co. (Hull), Ltd., installed in Rose's marmalade filling department.

Factory floors

No description of plant for jam manufacture can be considered complete without some reference to the building in which such opertions take place. The active ingredients in jam are fruit acids and sugars, and although one assumes that every care is taken to prevent spillage, contamination of walls and floors, especially the latter, is likely to take place occasionally in the best-run establishments and must be guarded against. The chief danger is the penetration of the floor surface by acids and reaction with the concrete beneath, causing tiles to become dislodged and allowing centres of fermentation and mould growth to form. The addition of sugar aggravates the situation.

Acalor (1948), Ltd., say they have specialised in the design of floors to resist these circumstances. This firm manufactures a range of anti-corrosive cements designed to resist the chemical effects of solutions coming into contact with the floor and the physical shock of temperature fluctuations and the passage of trucks. These cements are intended to bed and join impermeable tiles or paving of suitable composition.

It is also possible under certain circumstances to use some of the new synthetic resin materials in the form of a continuous monolithic layer; for this purpose, Acalor, Ltd., make *Acalastic* linings claimed to be more economical than tiling.

Acalastic Reaction Coatings made by this firm are intended for painting walls, machinery, etc., to provide protection against corrosion as well as decoration.

The jam factory of Wilkin and Sons, Ltd., of Tiptree. For delivering undamaged strawberry, raspberry, cherry, plum and other whole fruit jams to the filler heads of the jar filling machines, two stainless steel H70 Mono pumps are used, each running at the slow speed of 28 to 30 r.p.m. to fill approximately 2,000 1 lb. jars an hour.

▸ Air Control Installations, Ltd., have published leaflets describing two pieces of equipment which they make. The *Omicron* filter is described as a dry-type replaceable filter designed for applications demanding the highest possible efficiency in one leaflet while, in the other, the *AAF* air filter gauge is stated to give an automatic, unfailing warning when it is time to change filters in air conditioning and other equipment.

Crushed Fresh Strawberry Preserve

A new fruit product

By James D. Devey, B.Sc.

MANY reasons have been advanced for the continued decline in the consumption of jam in this country since before the last war. These include the effect of rationing, the introduction and widespread use of school and industrial canteens, the development of a so-called national "savoury" flavour preference, a higher standard of living, the increased foreign travel of the man-in-the-street and even the alleged poor quality of fruit preserves manufactured today.

It has long been the writer's belief that the jam produced in the United Kingdom at this time is all manufactured *down* to the minimum standards laid down in the Food Standards (Preserves) Order, S.I. No. 691 (1953), and consequently, as the bulk of jam is made from fruit preserved with sulphur dioxide, the flavour and colour are of indifferent quality. Little use is made of fresh and quick-frozen fruit for jam manufacture and there appears to be no doubt that flavour deteriorates when fruit is stored, sometimes for years, in sulphur dioxide solution. With preserved fruit, colour is adversely affected, leading to the use of added permitted colour in most types of jam, and texture is also altered so that apple pectin is usually added to factory-produced preserves.

Since long boiling times are associated with whole fruit strawberry jam manufacture and since this leads to poor colour production (browning) and loss of flavour, it occurred to the writer to experiment with the production of a strawberry product which would possess superior colour and flavour and which would be made from fresh or quick-frozen fruit.

It appeared feasible to assume that if a product could be made which required no boiling, then the result would be a preserve with fresh fruit colour and flavour. One has only to walk around a jam factory and smell the aroma of fruit to realise that most of the volatile flavour is lost from the jam!

The initial experiments using fresh strawberries have proved entirely successful and the product has the following advantages:

1. superior fresh fruit flavour.
2. superior natural colour.
3. no boiling required, therefore fuel savings possible.
4. less fruit required per batch, if necessary.
5. possibilities for continuous manufacture.

Point 4 requires elaboration. Because very little water evaporates from the product during manufacture the quantity of fruit used per batch can be less than the statutory minimum. This means, in effect, that a better flavoured product can be produced with less fruit, but it also means that such a product cannot be described as a jam, conserve or preserve. Hence a name such as "crush" would require to be adopted. Much has been written about the so-called preference for whole fruit preserves, but, in the case of strawberry jam, this is doubtful since the presence of whole fruit leads to loss of spreadability. It is therefore concluded that there would be a popular demand for a strawberry preserve which would be of superior quality, which may be cheaper and which would spread easily and be of use as a topping or filling for ice cream, cakes, pies, etc.

Manufacture

Strawberry Preserve

Formula for 150 lb. batch containing 38% fruit content and 65% T.S.S.:

fresh or frozen strawberry purée	57 lb.
granulated sugar	59 lb.
milled invert sugar	36 lb.
powdered citrus pectin (150 grade)	5 oz.
citric acid	1 oz.

Method: the strawberries are liquidised by machine or by passing through a fine sieve to produce a purée. This is added to the boiling pan together with the sugar and citric acid and the whole mixed thoroughly. This may be carried out more effectively by use of a mechanical mixer fitted with a paddle to pre-mix the ingredients. A small quantity of vegetable oil is added to minimise foaming. The mixture is heated to the boil, with stirring, and then the pectin is added, the mixture well stirred, and, when the total soluble solids (T.S.S.) are 65% by refractometer, the steam is turned off. The preserve is filled immediately into glass jars or cans, closures applied and the containers cooled.

As is well known, the addition of pectin and acid is obligatory for strawberry preserves, and it was decided to add invert sugar in powdered form as there is little invert sugar formed during the new process.

If a spread or crush is preferred, then liquid pectin can be used with the lower fruit content.

Strawberry Crush

Formula for 150 lb. batch containing 30% fruit content and 65% T.S.S.:

strawberry purée	45 lb.
granulated sugar	59 lb.
invert sugar	36 lb.
liquid apple pectin (5 grade) ..	10 lb.
citric acid	1 oz.

Method: as for strawberry preserve.

In both of the above products, and for the process as a whole, it is necessary to calculate the T.S.S. in order to arrive at the

correct quantities of ingredients. In the first formula the calculation is as follows:

		soluble solids
57 lb. of strawberry purée (@ 6% T.S.S.	≡	3·4 lb.
95 lb. of sugar (@ 100% T.S.S.	≡	95·0 lb.
5 oz. of pectin	≡	0·1 lb.
Total:		98·5 lb.

98·5 lb. of T.S.S. give 65·7% T.S.S. in 150 lb. of preserve. This allows for a very slight evaporation of water to give a 150 lb. batch.

In the second formula we have:

		soluble solids
45 lb. of strawberry purée (@ 6% T.S.S.	≡	2·7 lb.
95 lb. of sugar (@ 100% T.S.S.	≡	95·0 lb.
10 lb. of pectin (@ 10% T.S.S.	≡	1·0 lb.
Total:		98·7 lb.

98·7 lb. of T.S.S. give 65·8% T.S.S. in 150 lb. of crush.

The experiments described above have dealt with strawberries only as it has been decided to publish the results at this stage in view of the possible interest which may be aroused. It appears feasible to consider that the new technique would work equally well with other fruits, with corresponding alterations in quantity of fruit, pectin and sugar used, according to the legal standards or otherwise. The use of continuous processing techniques is worth considering and a machine similar to a heated trough with an Archimedean screw would perhaps be suitable. The mixture of materials could be fed in at one end and the preserve filled from the other end in a continuous cycle of production.

This short paper is offered as a sincere contribution to the preserves industry in the hope that the exploitation of its contents may assist in halting the decline of jam consumption by the production and sale of preserves of superior quality.

▸*Electrified Production* is the title of a new quarterly 4 page illustrated newsletter which is prepared by the Electrical Development Association for distribution through Electricity Boards to consumers. Copies may be obtained either through a Board or the E.D.A.

Correspondence

"Where are these people now?"

SIR,—I was very interested to see the picture shown on page 322 of the August number of FOOD MANUFACTURE with the caption "Where are these people now?" Whilst some of them may have passed on certainly quite a number of the people in the photograph are still very much in the land of the living, including yours truly.

To mention but a few, there is Mr. Tom Sutcliffe of T. C. Sutcliffe and Co., Ltd., Mr. Briggs of Arthur Holden and Co., Sir Robert Barlow of the Metal Box Co., Ltd., Mr. Rankin of the Metal Closures Co., Ltd., Mr. Len Birkett of Jarman and Cowley, Ltd., and Mr. Norman Gold, late of Eburite Cartons.

This photograph does bring back happy memories of the early days of the Canning Convention, and I should like to thank you and your staff for producing it from your archives.

T. W. WINTERSON,
Director, Wm. P. Hartley Ltd.,
Aintree, Liverpool 9.

Filled Milk

SIR,—We understand the significance of your complaint about our booklet "Waste—by Order." It would appear to us that this has been an inspired attack. Evidently the Editor is not aware that filled milks have, in many cases, been recommended to heart patients with the instructions that they must remain on them for the rest of their lives if they wish to prolong them; that they are in widespread use because of their better keeping qualities, greater palatability over tinned and other forms of dried milk, and more economical price structure. Surely the Editor does not seriously suggest that the already harassed caterer should be compelled to give the formula of all his consumable foods. Therefore, why single out one product of the many that he uses! It is a well-known fact that many cups of coffee have, as their milk content, simply skimmed milk, yet no offence is committed, but when Millac is used the Milk Marketing Board want special regulations, even though it is of a much higher nutritive value than the ingredient it is replacing.

The object of foodstuff regulations must be, first and foremost, to protect the public. Do they need any such protection? Not in this case. Providing a product is nutritious, has a ready sale and the customer comes back for more, how possibly can new regulations be justified?

We feel we should point out that the attacks initially came from the dairy interest and we are merely trying to defend ourselves. We have no clash with the dairy interest, in fact, because we use liquid milk as the basic ingredient of practically all our products.

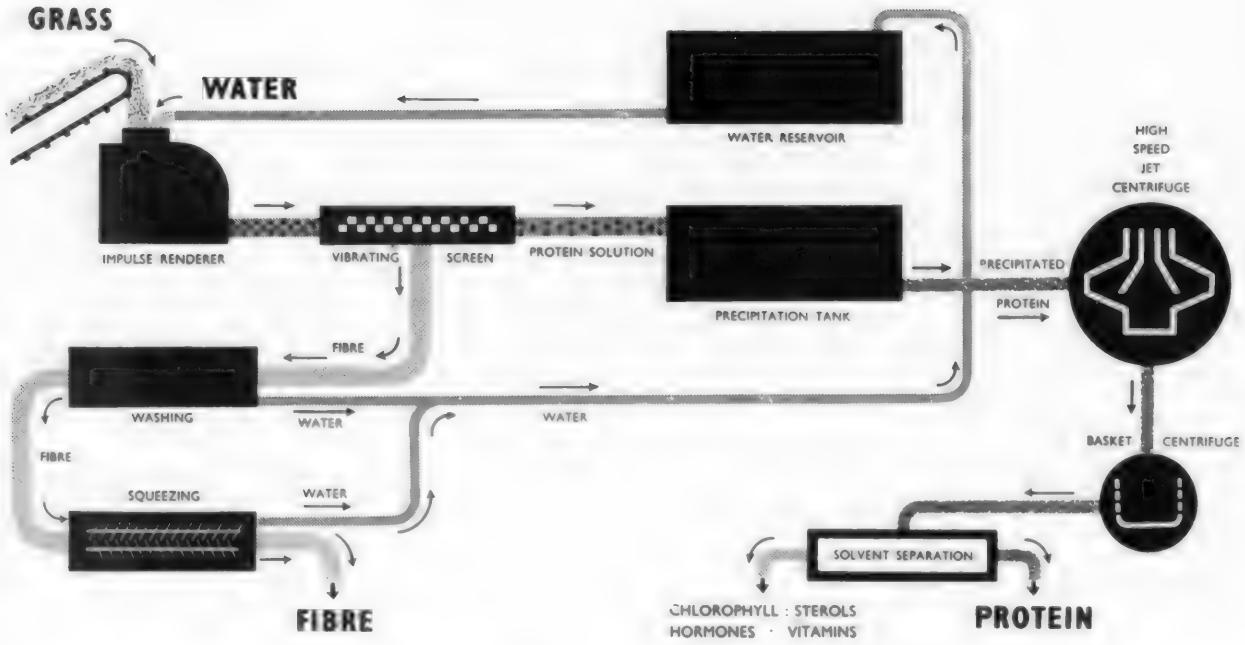
L. E. PRITCHITT & CO., LTD.,
Pinner, Middx.

Liquefied Herring

SIR,—May I be allowed to enlighten your readers about "liquefied herring"?

Strange though it may seem, they are just that: herring reduced to a liquid state by enzyme action under mildly acid conditions. The liquor is used, in combination with vegetable proteins, to produce "concentrates," which, mixed with cereals and other bits and bobs, finally emerge as compound feedingstuffs for livestock. And very nice, too; so all the better-bred pigs, the best broilers and the contented cows of my acquaintance tell me.

H. H. GOODWIN,
General Manager.
Herring Industry Board,
1, Glenfinlas Street,
Edinburgh, 3.



Edible Protein from Grass and Oilseeds

Shock-wave Process May Solve Problem of Protein Deficiency in Under-Developed Countries

A Food Manufacture Staff Report

GRASS, lucerne, thistles, weeds, oilseeds and almost any other variety of vegetable material can be made to yield protein directly usable as human food by a process unveiled recently by British Glues and Chemicals, Ltd., in London. It is called Impulse Process Protein because it is obtained by an impulse rendering process.

Oilseeds such as groundnuts are fed into a vessel in which beaters revolve, sending strong shock waves through a constantly flowing stream of water. These impulses burst open the cells of the groundnuts releasing oil in a free state, a protein-oil mixture, and carbohydrate. These constituents are separated out by a three-way centrifuge. The oil is ready for use after washing and clarification, the carbohydrate is washed and separated from the water by centrifuging, after which it is ready for use in feeding meal, and the protein-water mixture undergoes a number of processes. These include mixing with dilute sulphuric acid to precipitate the protein, and centrifuging. The product obtained from the basket centrifuge is a paste containing 2% protein, 1% oil, and 7% water. This goes to an azeotropic solvent extraction plant employing toluene. The object is to dry the protein and remove all fat while at the same time excluding air and preventing oxidation. The result is an oatmeal-coloured powder of good appearance which is ready for incorporation in cereal products, meat pastes, soups, curries, and similar foods.

Grass into protein

The process performs most strikingly with grass and similar vegetable material. Here it is necessary to separate out not only insoluble carbohydrates but considerable quantities of fibre also. The essential step in this process is the use of slightly alkaline water in the impulse rendering machine. This is based on a discovery by A. C. Chibnall and G. R. Tristram (Dr. Tristram of St. Andrews University is now a consultant to the company) that vegetable protein, unlike animal protein, could be dissolved in slightly alkaline water once it was freed from the cell. Thus, when the impulse machine smashes the grass cells, the protein-oil content remains in solution making it possible to remove the fibre in a vibrating screen. The protein solution is then precipitated and purified in the way described for groundnut protein. The fibre is washed and de-watered and made ready for paper or wallboard manufacture.

Grass protein is grey-blue in colour and less attractive looking than groundnut protein. But it has excellent nutritional value and

Above: **This diagram shows how vegetable protein is produced on an industrial scale from leaf material using the Impulse Process.**

it can be incorporated in soups, meat pastes, sausages, and similar foods.

One of the most valuable by-products of the grass is a syrup containing chlorophyll, carotene, xanthophylls, sterols, steroids, and possibly vitamin E. Dr. Tristram is working on methods of separating out these valuable constituents. Carotene and steroids would be particularly valuable to the pharmaceutical industry. While this syrup is potentially the most valuable by-product of the process, it will be some time before commercial processes will be available for treating it successfully.

British Glues have developed Impulse Process Protein from the cold degreasing process by which they extract fat from bones. This was invented by Mr. Israel Chayen, their technical director, and it is now used throughout their factories for preparing bones for gelatine manufacture. Its great advantage is that it requires no heat or solvent so that it is safer and gives a better product.

While it is much easier to smash vegetable cells than bone cells, it took seven years to do two things: to arrive at the right degree of shock treatment so as to avoid turning the mass into an inseparable "mayonnaise," and to find a way of keeping the protein in suspension. Alkaline water was the answer to the second problem, and beater arms (*not* ultrasonics) was the answer to the first.

Mr. I. H. Chayen, (*left*), assistant managing director, and Mr. Harold Cotes, chairman of British Glues and Chemicals, Ltd., watching liquid pouring from the impulse renderer. Protein is separated from this liquid by a series of processes. Striking results have been obtained with grass and similar vegetable material where it is necessary to separate not only the insoluble carbohydrates but also considerable quantities of fibre.

Output of plant

Mr. Chayen reckoned that from 100 tons of groundnuts, the process would yield 22 tons of pure protein, 44 tons of oil and 18 tons of starch and other carbohydrate. From fresh grass, containing 80% water, the process would yield 2.25 tons of pure protein, 7 tons of fibre, and 0·6 tons of chlorophyll "syrup."

For 15 months British Glues have operated a one ton per day pilot plant at their Bermondsey factory. They are convinced that the process works well and that the products are wholesome and acceptable. They see their greatest markets for the process in India, the Middle East, and West Africa, where there is serious protein deficiency. Firm enquiries have been received from India, Nigeria, Ghana, Lebanon, and Israel. These countries see in the process a way of making available to their people vast quantities of proteins in vegetable matter which are now inaccessible. The process is ideally suited for such countries because the fibre produced could be used to fuel the plant, thus approaching something of a thermal balance. A plant turning out 5,500 tons of protein per annum would need 50,000 kwh per week.

Cost estimates

Mr. Chayen was asked the cost of the plant. He said that to install a plant to provide a community with one ounce per day of protein would cost 10s. per head. Translated to the problem of India, it would cost £200 million in capital investment to provide enough plants to yield one ounce of protein per head per day. This is a huge sum and it will not all be provided at once. But the Indians are very attracted to the process, and Mr. Chayen was quite hopeful that they would take it up.

The policy of the company is to provide plants under licence agreements in return for royalties based on the throughputs.

Inspection of Foods

THE fifth edition of a volume* intended to meet what the authors consider to be a definite necessity has been published with certain necessary revisions in the text. The book summarises many weighty though excellent volumes and endeavours to sift the grain from the chaff, helping public health students with their examinations.

The authors, who are practising public health officers, say that they have on occasion had to remind themselves in a speedy manner of an essential point on food inspection and this work is the outcome.

* *Food Inspection Notes.* 5th Edition. By H. Hill and E. Dodsworth. H. K. Lewis and Co., Ltd., London. Pp. viii+128. Price 10s. 6d. net.

Machinery and Equipment

VENTILATING EQUIPMENT

Among the new products manufactured by Templewood Hawksley, a member company of the Hawker Siddeley Group, are: a power-operated roofing shutter which is said to provide for rapid clearing of smoke and fumes, at the same time giving adequate lighting at working level and; cowl extractor ventilators designed for natural controlled ventilation where complete storm protection is required.

Both products are stated to be suitable for flat, sloping, sheeted or glazed roof structures and installation can proceed in nearly all cases without interruption to production.

DUST COLLECTOR SERVICING

Dallow Lambert and Co., Ltd., have announced the introduction of a unit dust collector servicing scheme which is believed to be the first of its kind in this country.

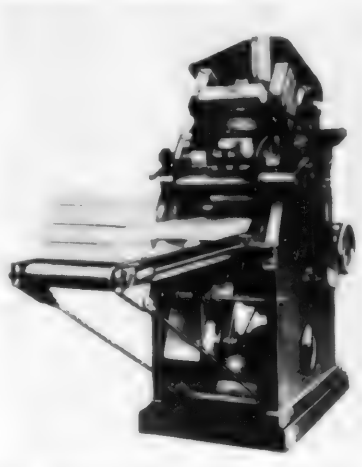
Experience shows all too frequently, that owing to the ancillary nature of dust control processes, the equipment tends to be overlooked when the general maintenance routine is laid down in respect of the main machines or operations.

The new scheme has been introduced for the purpose of keeping Dallow Lambert unit dust collectors in good condition and functioning efficiently. A fully trained service engineer makes regular visits at 6 monthly intervals, or at other dates mutually agreed, and services each dust collector, replacing any parts that are necessary to put the equipment in first class working condition. The charges for this are said to be extremely reasonable.

MACARONI PACKAGING MACHINE

An interesting machine for the packaging of macaroni, spaghetti or other long pasta was recently shown in Milan. The machine, the *Tecantos Prima* made by Messrs. Meneghini, is designed to pack previously cut and weighed 1 or 2 lb. portions of long pasta into prefabricated pasteboard boxes. It is capable of packing about 24 boxes per min. or a ton every 80 min., providing there are sufficient attendants, or ⅓ ton per hr., with one attendant.

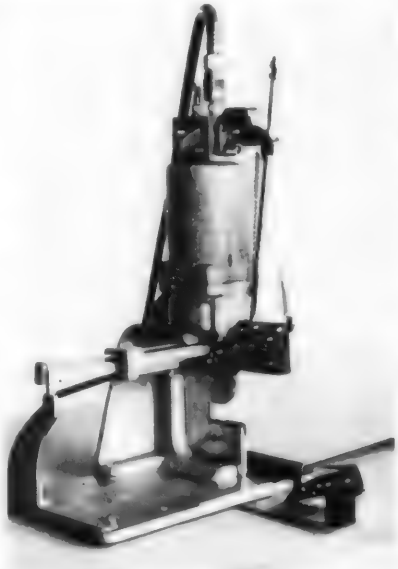
In operation, a sucker catches a flat piece of lithographed cardboard from a stack and passes it to mechanical shapers which fold and form the cardboard into a box with the upper flap open. A portion of macaroni is slid into the box as it is held horizontally to prevent empty spaces forming inside the pack.



The Tecantos Prima macaroni packing machine made by Meneghini is designed to pack previously cut and weighed 1 or 2 lb. portions into boxes, and has an output of about 24 boxes per min.

The boxes produced may be either square or rectangular and suitable for macaroni 11 in. long.

The machine has 2 electric motors: a 1 h.p. motor operates it while a 0.7 h.p. motor drives the suction pump.



The Tipperette pneumatic machine for applying first and second closures to casings and bags is made by Viskase, Ltd.

TEMPERATURE RECORDER

A temperature recorder which may be used in cooking vessels, sterilisers or even in lorries during the transit of perishable goods is being marketed by the Cambridge Instrument Co., Ltd.

Known as the *Minican* temperature recorder, the instrument has a 40 mm. wide chart mounted on a drum which revolves at a consistent rate. The pen is moved by the expansion and contraction of the liquid inside a stainless steel bulb, either plain or spiral shaped, and the drum is moved by a clockwork mechanism. Both chart and pen are completely enclosed in a chromium plated brass cylinder which is both liquid and gas proof.

The makers say the accuracy of 0.5 mm. (0.02 in.) on the chart can be expected and the minimum range across the chart is 50°.

A packet containing 100 charts and a special bottle of ink is supplied with each recorder.

PNEUMATIC CLOSING MACHINE

A new pneumatic machine for applying the first and second ties to casings and bags was shown recently by Viskase, Ltd. Called the *Tipperette*, it weighs only 12 lb. and is said to be both quick and simple to operate.

Extremely versatile, this machine will close filled poultry bags with or without vacuum and Viskase say that it requires no adjustment for different sizes of casing. There are only four moving parts said to make the machine easy to clean and compressed air is claimed to eliminate electrical hazards.

The end of the casing or bag is inserted in the throat of the machine which is then closed by pulling down the lever. The wrap is drawn tight and the metal clip is applied from the magazine feed by pressing the lever inwards toward the body of the machine. Finally any excess casing is trimmed. The operation can be carried out in two seconds.

The machine eliminates the need for string ties on sausage or cooked meat products. If these are to be hung for cooking or smoking a pre-tied loop of twine can be placed under the clip at either end. Labels can be attached with the closure and will not be removed by handling or climatic conditions and the clips will neither damage the casing or bag nor come loose.

American designed, this new machine will be manufactured in this country by T. J. Brooks (Autos), Ltd. Viskase, Ltd., will act as sales agents for the U.K. and Ireland.

POLYTHENE SCOOP

The latest addition to the range of polythene products marketed by Tool Treatments (Chemicals) Ltd., is a scoop made of white rigid sterilisable polythene which will not sag or bend when full. It is described as combining great strength with lightness (total weight 6½ oz.) and impervious to chemical action. The polythene is unaffected by extremes of temperature, and the scoop is therefore of great value to the frozen foods trades, etc. Dimensions are 5½ in. wide, 3½ in. deep, 9 in. long, with a 4½ in. handle.

FORK LIFT TRUCK

A small fork-lift truck, having a length of only 37 in. but stated to possess the advantages of the sit-on rider controlled trucks, is available from G. Hunter (London), Ltd.

Known as the *Piccolift*, the truck has a capacity of 1,120 lb. at 24 in. or 1,300 lb. at 20 in. load centres. The truck is three-wheeled and has an inpendent motor on each front wheel. Towing capacity is available up to 10 tons and height of lift from 60 in. up to 138 in. can be supplied. The drive is by electric traction batteries and cushion tyres are fitted as standard.

ELEVATING TROLLEY

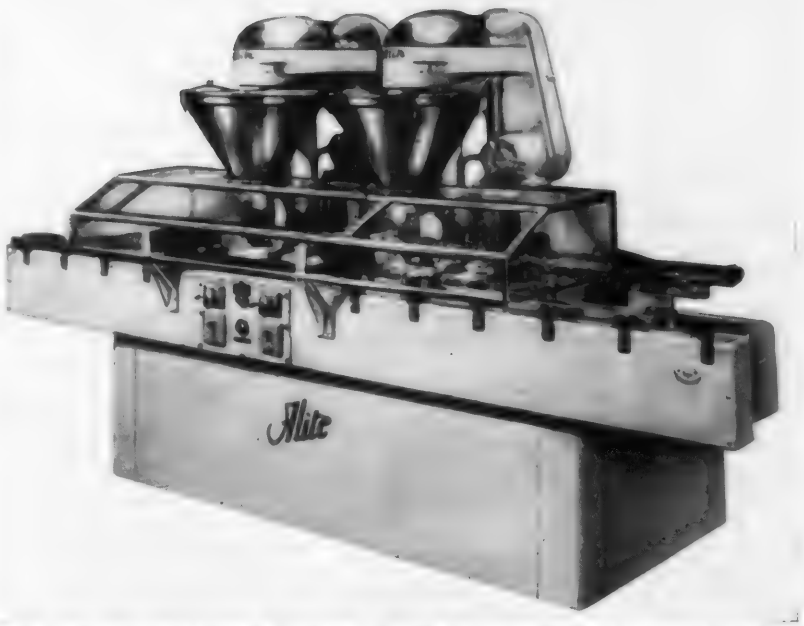
Skysorlift is the name of a new hydraulic elevating trolley produced by Farrow and Jackson, Ltd.

An inclined or horizontal hydraulic ram, lifting heavy duty metal scissor guides, through cams and rollers, provides a strong, positive and smooth action elevating trolley, said to be suitable for long periods of heavy work.

The lifting mechanism is actuated by either a foot or hand operated pump, the pump unit being provided with a release valve that allows for controlled descent. The minimum lowered height is 9 in. and a varying range of lifts can be supplied to suit individual problems and applications.

The trolley is fitted with either four swivelling wheels or two fixed wheels and two "stillage" type feet and standard "tug-lift."

The new Skysorlift hydraulic elevating trolley made by Farrow and Jackson, Ltd., has a minimum lowered height of 9 in.



The Alite twin-head powder filling and lidding machine, made by Arenco-Alite, Ltd.

MACHINERY MERGER

Arenco A.B. of Sweden and Alite Machines, Ltd., of Great Britain, have formed a common company under the title of Arenco-Alite, Ltd., the address and telephone number being: Pixmore Avenue, Letchworth, Herts. Letchworth 965.

At the same time an arrangement has been entered into for the selling and servicing of the *Kisab* range of strip wrapping machines in this country. Coincident with the formation of this organisation is the introduction of a new *Alite* powder filling and press-on lidding machine.

Designed for the handling of powders including granular products, cocoa, coffee, flours, mustard, sugar, peppers and the other spices, the machine has twin filling heads followed by the lidding station (a single head model is available where smaller outputs are required). It will handle tins or composite containers either oval, round, rectangular or other odd shapes with capacities from ¼ oz. up to 2 lb. at speeds from 60 to 100 per min. The containers are fed on to a nylon slat conveyor which runs through the front of the machine. They are then transferred into the pockets of a horizontally positively indexed chain and fed to the filling stations for a dust free volumetrically controlled fill and, when necessary, a vacuum pre-extraction of container and simulation of air from the products unit can be fitted, the containers being indexed to the lidding station.

The lids are fed by a positively controlled and gauged "cake-walk" conveyor which is parallel and diametrically opposite to the body feed. The lids are then slide controlled into and through the capping jaws and punched directly on to the bodies.

Another machine is for the heat sealing of polyethelene or p.v.c. tubes. Known as the *Gap* heat sealing machine, it is designed for use with the Arenco GAB Tube Filling Machine and when used together forms a completely automatic unit which can be used for either polyethelene or metal tubes. Change over between the two types of tubes is said to be simple.

PUSHBUTTON CONTROL

Geo. W. King, Ltd., have announced the *Snip Snap*, a new mains pushbutton control for hoists. Primarily designed for their *Mytemin* and *Marvex* range, the control may be applied to other types and makes of hoists, cranes and similiar appliances which are wired for mains supply.

The control may be used in place of the conventional type of reversing contactor, since it combines the function of contactor and pushbutton in one compact unit. The patented action avoids the possibility of single phasing.

It is constructed from a shock resistant cloth-filled plastic material and is totally enclosed in a *Neoprene* rubber cover, providing not only a seal against the ingress of moisture but excellent protection against mechanical shocks and damage. Access to the working mechanism is gained by the removal of 4 screws.

The device is not suitable where low voltage control is required, nor can it be employed for remote control arrangements other than by simple extension of the feed cable.

Advances in Food Technology

ANALYSIS

Egg Solids Determination

A method is described for the determination of egg solids in foods in which hydrolysis of the phospholipids is effected by means of the enzyme lecithinase D. The liberated chlorine is separated by adsorption on a cation-exchange resin and, after elution, is determined colorimetrically as the reineckate.

This enzyme is found in several vegetables and the preparation from cabbage leaves of a concentrate sufficiently pure to serve the purpose is described. The lecithinase concentrate can be stored as a freeze-dried powder at a normal room temperature.

The determination of egg solids in salad cream is dealt with and it is shown that the enzymic hydrolysis gives more accurate results than acid hydrolysis, since interference by the mustard is reduced. Enzymic hydrolysis has also been applied to the determination of egg in ice cream and in lemon curd.—C. B. Casson and F. J. Griffin, *Analyst*, 1959, **84** (998), 281.

BACON

Quality Influences

The influence of the feeding and treatment accorded to pigs prior to slaughter on the quality of cured bacon has been investigated in a series of controlled tests, carried out at the Danish Meat Research Institute, Roskilde. In particular, an investigation has been carried out on the effect of feeding sugar to pigs during the rest period prior to slaughter. This equipment extended over a period of eight weeks and showed that the sugar feeding resulted in an increased bacon yield during curing and maturation and in an improved keeping quality of the bacon sides.—J. Wismer Pederson, *Die Fleischwirtschaft*, 1959, **11**, 653.

Determining Water Content

In view of the emphasis placed upon the quality of bacon and fat, breeding and feeding experiments must often be accompanied by chemical analyses of certain constituents. Because of the great number of samples which often accrue at the termination of fattening tests and which must, in order to obtain comparable results, be investigated as quickly as possible, it is desirable to resort to simplified, yet reasonably accurate high-speed testing methods.

One such method, much used in Sweden, still suffers from the difficulty that the necessary weighing tests must be carried out in an air-conditioned room. This difficulty is overcome by a modified method which has been developed at the Institute for Cattle Breeding and Cattle Feeding at Bonn University on the basis of the Swedish method.—W. Hartfiel, *Die Fleischwirtschaft*, 1959, **11**, 599.

HEATING

Thermocouple Errors

The nature and the size of errors caused by the conduction of heat along thermocouple wires have been investigated under conditions similar to those in cans of food which heat by conduction. Most of the results agreed with the predictions of a theoretical equation developed by J. C. Jaeger, but there were significant deviations from the theoretical predictions if heavy wire was used.

The results support the principle of O. F. Eckland's recommendation that conduction errors should be allowed for by applying the appropriate correction when considering the heating phase of a process. However the error in f_h is also appreciable if unusually heavy wires are used.

Conduction errors are largest in the early stages of heating and cooling and they often cause large errors in the evaluation of the lethal value of the cooling phases of processes. It is suggested that fine wires of much lower thermal conductivity than copper should be used when accurate assessment of the cooling phase is required.—N. D. Cowell, H. L. Evans, *et al.*, *Food Technol.*, 1959, **13** (8), 425.

WHEAT FLOUR

Water Absorption

The water absorptions of flour from 23 samples taken from 2 varieties of flour have been measured. The two varieties of wheat studied were both English, a hard wheat, Atle, and a soft wheat, Hybrid 46. The millings were made on a Buhler experimental mill and the wheat was cold-conditioned to 15·5% moisture content. The extraction rate was 65-68%. The absorption tests were carried out by the Halton method and the apparatus used was made by Henry Simon, Ltd.

Comparison of results with estimated flour-nitrogen and damaged starch content indicated that differences in absorption were largely accounted for by the variation in these factors. The evidence also confirmed previous suggestions that more starch damage occurs in the milling of hard than soft wheats and that in hard wheats starch damage is more likely to increase with the protein content of the wheat.—E. N. Greer and B. A. Stewart, *J. Sci. Food Agric.*, 1959, **10** (4), 248.

POTATOES

Radiation Preserving

A French company (Conservatome) has carried out an extensive research programme on the preservation of foodstuffs by means of ionising radiation. It has been found that treatment with gamma or electron rays can, in many cases, provide a satisfactory solution to the problem.

Tests with several varieties of potatoes have shown that budding can be greatly delayed by an irradiation of 5,000 rads and wholly suppressed by one of 7,500 rads. Very strong irradiation, however, has certain detrimental effects. For industrial irradiation methods, a dosage of 10,000 rads appears to be most suitable. Such irradiation does not cause any undesirable changes in the structure of the potatoes treated which retain their freshness for many months. In view of the high waste percentage still encountered in potato storage, the application of such methods can result in very appreciable savings.—Pierre Vidal, *Industries Alimentaires et Agricoles*, 1959, **76**, 273.

Heating of Fishmeal

(*Concluded from page 390*)

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The author is greatly indebted to Dr. C. L. Cutting, Dr. G. M. Dreosti and Dr. J. A. Lovern for reading the manuscript at various early stages.

News Digest

ISIS Appointments Register – A New Service

Competition among employers for science graduates is as strong as ever, as is proved by the large sums now being spent on advertisements in newspapers and technical journals. To the cost of advertising must be added the expense of management consultants and others whose services are being used to help satisfy the often desperate need for scientific and technological recruits of graduate status. A far less expensive way of solving this problem has been put forward by Mr. Leonard Hill, Chairman of the Leonard Hill Technical Group of periodicals, reference books and textbooks. His long experience as a technical and industrial publisher has given Mr. Hill a deep insight into the problem of staff recruitment and the new system he proposes is the fruit of a long study of the situation. The idea—like most good ideas—is simple.

Most students seek temporary employment during the university vacations. Mr. Hill proposes that science students should work temporarily for firms of the type which would offer them jobs after they have graduated. This would enable students to become acquainted with industries in which they propose to make careers and, conversely, would enable firms to assess the potentialities of young men and women whom they may wish to employ after they have obtained their degrees.

Both sides stand to benefit enormously from this scheme of selective vacation employment and because there are such strong mutual advantages it should work well.

How will it work? Mr. Hill has established the ISIS Appointments Register at the headquarters of the Leonard Hill Group, 7-9, Eden Street, London, N.W.1. Science students will be invited to apply for registration and firms requiring temporary staff will be invited to submit details of the jobs they can offer. In this way ISIS will bring together employers and employees in an economical and efficient manner. A further saving to employers will be the elimination of extra work caused by the employment of temporary workers. This will be done by employers paying ISIS who will in turn pay the students and deal with all income tax and insurance details. In effect, the students will be employed by ISIS.

During the period of temporary employment firms will be expected to give students work commensurate with their abilities, with the knowledge that the way in which the students are treated will naturally influence their choice of future career and employer. Most students will cheerfully undertake most jobs, provided they are intelligently and sympathetically handled and are given proper opportunities to assess the career possibilities offered.

ISIS Appointments Register will bring together employers and future employees for a valuable preliminary period. The use that is made of this period depends upon the good sense of each side.

Employers who require further details of this service to industry should communicate immediately with ISIS Appointments Register, 7-9, Eden Street, London, N.W.1. (Telephone Euston 5911.) Registration of employers' requirements for the Christmas vacation will begin on October 30.

Fresh-frozen milk

Fresh British dairy milk, treated with sound waves and then frozen solid, may be marketed throughout the world as a result of a project sponsored by the National Research Development Corporation. The project may also enable British farmers to sell any surplus milk at higher prices.

The process will keep milk fresh-frozen for 18 months provided the temperature of the milk is kept below 8°F.; this will enable it to be shipped anywhere, particularly to tropical countries where fresh milk supplies are not normally available.

The new British process is believed the first to achieve complete success for when this milk is thawed out (unlike the currently available frozen homogenised milk) it returns to a completely natural state without any alteration in condition or taste.

The process was evolved by Dr. W. G. Wearmouth at the National Institute for Research in Dairying, and the invention is now under the control of the N.R.D.C., which holds patents at home and abroad covering the technique. A major British ice-cream manufacturing company has been granted a licence to produce the frozen milk which is already being made in small quantities. Full-scale production will start later this year.

The process, after normal pasteurisation, consists of treating the milk with ultrasonic vibrations of about a million cycles per second for five minutes, and pouring it into containers for quick freezing. The process is continuous and there is no delay between the different operations. The milk can be transported in containers of up to 1 gal. capacity in refrigerated ships, trains or lorries, and is also sold in liquid-proof cartons down to ½ pt. size.

Scottish offices

A new £30,000 block of offices, to serve the Scottish division of United Glass, Ltd., has been opened at Bridge of Allan, Stirlingshire, by United Glass chairman, Mr. Leonard Elgood, O.B.E. (MIL.), M.C., D.L., J.P., C.A.

Air freight packaging

A new section, No. 20, of B.S.I.'s Packaging Code (B.S. 1133) entitled *Packaging for air freight*, gives in general terms guidance on the special considerations involved in packaging for air transport which, if followed, should greatly assist packers in avoiding wasted time and energy. Much financial loss caused through faulty packaging should also be prevented.

Copies of the standard may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1. Price 4s. 6d. (Postage will be charged extra to non-subscribers.)

Cellulose casing developments

A new type of cellulose casing for the manufacture of slicing sausage has been introduced by Viskase, Ltd. Called *Precision* cellulose casing, it is intended to produce completely uniform results for a given size. It also stated to incorporate the exact shaping characteristics of the more expensive *Fibrous* casings but has a high sheen.

This new product is made for specified circumferences in nine different sizes which, when stuffed, range from 6½ in. up to 17 in. A high resistance to breakage and to stretch during stuffing are claimed for it. The casing is porous, allowing the meat to "breathe" and the finished product can be cooked in the casing. It can be printed with brand names and designs in attractive colours. The makers say that the casing should be soaked in the usual way and filled out with just sufficient hold-back to reach the correct circumference.

Standard for refrigerators

Two British Standards for electric refrigerators and food freezers are now streamlined into one new and revised publication. They are B.S. 922 (requirements for all climates) and B.S. 1691 (for temperate climates only). Two upper limits of test temperature, 90°F. for temperate climates and 110°F. for all climates, are now specified in the combined version.

Add one teaspoonful to cup

Britain is ready to accept a revolution in tea drinking habits, or so Nestlés believe, for they have introduced a new instant tea called *Nestea* which may render the teapot obsolete. Shops in Southern England and the London area are to receive supplies of this tea during October.

Mr. F. Kirby, managing director of Nestlés, speaking at a meeting of salesmen said that the success of their business depended entirely on meeting the changing trend of the market.

Nestlés have been working on instant tea for 15 years and they now believe that they have produced a product which will pass the test of the discriminating British public. Among the main selling points will be "elimination of waste, made instantly in the cup and available in a moment and no messy tea leaves."

Plastic spoons are being offered with every jar and Nestlés are launching a full TV and Press campaign. Retailers are being supplied with three dimensional dummies, window stickers, back drops and six-jar outers.

Hormone implant for cattle

A steer and heifer finishing implant which significantly increases and accelerates weight gain has been introduced to Britain by E. R. Squibb and Sons, Ltd. The implant was developed jointly by E. R. Squibb and Sons in the United States and Syntex, S.A. in Mexico.

Known commercially as *Synovex*, the new implant is a combination of two natural hormones, progesterone and estradiol benzoate. It can be used for cattle both on pasture and during the feed-lot period.

The product was recently made available in Canada following approval of its use by livestock growers by the Canadian Food and Drug Directorate, a food and drug bureau with some of the highest standards in the world. Approval in Canada followed extensive trials and publication of several papers in Canadian veterinary publications.

The administration of *Synovex* in steers in Canadian tests is claimed to have resulted in an average extra weight gain of 1/2 lb. per day, up to 20% more efficient utilisation of feed, and a substantially lower cost per lb. of weight gain.

Carcase dissection unit

The new P.I.D.A. carcase dissection unit at Stotfold, Beds., which is being run in conjunction with the National Pig Progeny Testing Board at their progeny testing station there is due to come into full operation in mid-October. The carcases will be supplied by the five progeny testing stations and the unit will be staffed by a meat technologist, two butchers and a recorder.

Some 800 carcases will be dissected in the first year.

In the initial stages the work will be confined to the bacon carcase. In the near future, it is hoped that pigs intended for the pork and manufacturing trades will be included.

British agency

Clarke-Built, Ltd., have been appointed the exclusive distributors for the products of the Cherry-Burrell Corporation of Cedar Rapids, Iowa, U.S.A.

The machines made by this firm include homogenisers, soft drink syrup makers, an instant solubility system for drying skimmed milk, a curd tension meter, tanks and warning devices for tanks.

New Kraft offices

Kraft Foods, Ltd., move their London executive offices to a new building in the Marylebone Road. There they will have the second and third floors of Regina House—an area of over 12,000 sq. ft. which is half as much again as they had at Morris House, Berkeley Square.

The new offices will be the London headquarters of the sales, marketing and administration executives, and the staff will number 45 to 50, an increase of 50% over the figure for 1955.

Egg prepack quest

A joint committee formed by the Produce Prepackaging Development Association in conjunction with the British Egg Marketing Board is inviting the co-operation of manufacturers in evolving new egg prepacks.

At present over 600 million dozen home-produced eggs are marketed annually under the *British Lion* brand; the introduction of a first-class prepack offering maximum sales appeal should encourage increased consumption of British eggs.

The Produce Prepackaging Development Association has been engaged to work on the problems. Two stages of investigation are planned in the development of new, economic prepacks which are good commercial propositions. The first stage is a short term project to develop prepacks which can be used on equipment in existing packhouses. The second will be the investigation of new, perhaps unconventional, methods of egg prepacking.

Onion peeler shown

A machine for peeling onions, believed to be the first of its kind in the world, was demonstrated recently in front of interested manufacturers at the B.F.M.I.R.A. Laboratories at Leatherhead. As yet it is not known how the resultant onions compare with hand peeling but it is thought that within two years the estimated 700 million onions peeled annually by outworkers will mostly be handled by machine.

Wm. Brierley, Collier and Hartley, Ltd., are the makers.

Holding company

Follsain, Ltd., has been made the holding company of Follsain-Wycliffe Foundries, Ltd., and of Varatio-Strateline Gears, Ltd.

Polythene film

Member firms of the Packaging Films Manufacturers' Association who manufacture polythene film have agreed that as from October 1, 1959, the method of describing gussetted polythene tubular film on the reel and in bag form shall be in accordance with Section K British Standards Institution, Packaging Code B.S.1133, Section 7 1952. This nomenclature has long been recognised by converters and users of cellulose film and paper bags.

The code expresses the dimensions of gussetted bags as face width times the extended layflat tubular width, *e.g.* gussetted dimensions previously described by some manufacturers as 4 in. face × 2 in. gusset, will now be defined as 4 in. × 6 in.

Fortieth anniversary

Drs. L. Hœjenbos, managing director of Polak's Frutal Works N.V., Amersfoort, Holland, recently celebrated his fortieth anniversary in the service of the firm.

Among the speakers to praise Drs. L. Hœjenbos on the firm's growth were Mr. Jacob Polak, one of the founders of the company and chairman, Mr. J. E. Meihuizen, co-director, Amersfoort, and Mr. R. de Kat, managing director of Soflor, Ltd., a British associated company.

When Mr. Henry Polak, brother of Mr. Jacob Polak, and co-founder of the company died in 1931, Drs. Hœjenbos was called upon to undertake the technical management. In May, 1940, at the outbreak of World War II, the Polak family left for America, when Drs. Hœjenbos shouldered the overall management of the Amersfoort firm under very trying conditions.

In co-operation with Dr. A. Coppens, Drs. Hœjenbos wrote many articles on flavouring and aromatic materials.

Beecham price reductions

Beecham Group, Ltd., have reduced the retail prices of the larger sizes of their leading beverage products. Lucozade, Ribena and PLJ, will be reduced by 3d. a bottle. The saving for the consumer over the next twelve months is estimated as more than £750,000.

In conjunction with these new trade terms provision has been made to release retailers from their undertaking not to sell beverage products manufactured by Beecham Foods, Ltd., below fixed retail prices.

Industrial injuries appeals

From September 28, there will be a right of appeal on a point of law from the decisions of medical appeal tribunals to the Industrial Injuries Commissioner, provided that leave to appeal is given, either by the tribunal or the Commissioner. This is the effect of regulations made by Mr. John Boyd-Carpenter, Minister of Pensions and National Insurance which bring into operation Section 2 of the Family Allowances and National Insurance Act, 1959.

Medical appeal tribunals hear appeals from decisions of medical boards under the Industrial Injuries Act.

London offices

The new London sales office of Eskimo Foods, Ltd., is 140/146, Camden Street, Camden Town, London, N.W.1. Tel.: GULliver 7081. The London sales manager is Mr. I. R. Henderson.

The London area sales office of Northern Aluminium Co., Ltd., is now at 50, Eastbourne Terrace, London, W.2. Tel.: Paddington 3281. Telegraph: Noralumin, London.

New Scottish office

Viskase, Ltd., have opened a Scottish office at 87a, West Bow, Edinburgh 1, tel.: Caledonian 4087. This branch office will be staffed to deal with enquiries and, when necessary, will help customers get in touch with representatives quickly. In addition, a stock of casings will be kept on the premises.

Sales organisation

Brown and Polson, Ltd., have announced the formation of a new sales organisation called Brown and Polson (Sales), Ltd. The sales organisation has been divided into three groups: starch group, refinery group and package group.

The purpose of this according to Mr. S. R. Brown, managing director of Brown and Polson, Ltd., is to give close service to the individual needs of their customers in each of their spheres by increasing specialisation within the company.

"Oh, no! Not Chinese food again."

Dundee factory to handle fish products

New equipment is now being installed at Smedley's canneries and quick freezing plant to handle quick-frozen fish products, which will mean employment for almost 100—more than double the normal winter labour force. It will also mean the end of a 12 week close down at the end of the fruit and vegetable season.

The new plant starts operation this month and will supplement the fish products plant at Blairgowrie.

Preservers bought out

Towers Holdings, Ltd., have announced that they have acquired the entire share capital of Goldhanger Fruit Farms, Ltd. Towers Holdings, Ltd., manufacture through a wholly owned subsidiary, Mitcham Foods, Ltd., margarine, cooking fats and other processed foods.

Goldhanger Fruit Farms, Ltd., are canners of a wide range of fruits and vegetables and manufacturers of jam, jellies, etc., and have factories situated near Maldon, Essex, and Bridgend, Glamorgan.

Anglo-Soviet agreement on consumer goods

An agreement was recently signed in London on the quotas for consumer goods to be exchanged between the Soviet Union and the United Kingdom in the year ending June 30, 1960.

Among the quotas (value f.o.b.) for Soviet goods to be imported are: canned crabmeat, £1,000,000; canned salmon, £500,000; vodka, £300,000; wines and brandies, £100,000; and caviare (including red caviare) £85,000.

In addition licences for £550,000 c.i.f. of Soviet canned salmon will be issued under arrangements made outside this agreement.

Macaroni plant of the future

Speaking at a technical and managerial conference on the British macaroni industry held in London on September 22, Dr. Ch. Hummel of Switzerland said that the development of the future would be a continuous automatic plant for macaroni products.

Other speakers included Mr. Leslie Frewin, who spoke on public relations work carried out for the British Macaroni Industry, Ltd., and plans for the future, Mr. A. H. Elliott who spoke on market research carried out, Mr. Charles M. Hoskins, an independent consultant to the American industry, spoke on the study of raw materials and macaroni products, and Mr. Ernst of Buhler Bros., Switzerland, gave a general outline of their latest machines.

Mr. Di Taranto of Braibanti and Co., Milan, also addressed the meeting and a film of the Spaghetti Eating Competition held in Soho was shown.

News for Importers

Import duty reliefs.—The Treasury have made the Import Duty Reliefs (No. 1) Order, 1959, which provides for the relief from protective duty chargeable under the Import Duties Act, 1958, of herrings imported or (within certain limits) purchased after importation for conversion into meal and oil.

The Order came into operation on August 31, 1959, and has been published as Statutory Instruments 1959, No. 1505.

Import duty drawbacks.—The Treasury have made the Import Duty Drawbacks (No. 9) Order, 1959, which reduces the rates of drawback of import duty on imported unblanched shelled almonds used in the manufacture of certain exported blanched almonds or marzipan.

The Order came into operation on August 27, 1959, and has been published as Statutory Instruments 1959, No. 1474.

Dollar area imports.—The quota of £300,000 c.i.f. established last year for imports of fruit juices from the dollar area will be repeated for the year commencing October 1, 1959. On this occasion, the timing limitation on imports of grapefruit juice and orange juice will no longer apply and licences will be valid for all types of fruit juices throughout the period, *i.e.*, October 1, 1959, to September 30, 1960.

A quota of £450,000 c.i.f. was established last year for the import in 1959 of canned grapefruit from the dollar area. Licences were valid for imports during the months June to September inclusive. For the year from October 1, 1959, the quota remains unchanged but licences will be valid for imports throughout the period, *i.e.*, from October 1, 1959, to September 30, 1960.

PEOPLE

MR. R. J. BELL, formerly district manager of Northern Ireland, has been promoted to become assistant district manager of London, East Anglia and the South by Campbell's Soups, Ltd. The district manager is Mr. P. C. Adams.

MR. R. J. HADDEN has replaced Mr. Bell as district manager of Northern Ireland.

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MR. L. C. BLAKE and MR. A. E. PEGGS have been appointed additional representatives for the London area by Crofts (Engineers), Ltd.

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MR. J. F. SMALL has been appointed assistant to the director of the Glass Manufacturers' Federation and MR. J. F. HOBBS has been appointed assistant secretary.

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MR. H. J. PODMORE has been appointed manager of the new Midland sales office opened by Birlec, Ltd., at the company's main premises in Tyburn Road, Birmingham 24. He joined the firm in 1955 as sales manager of the dryer and gas plant division.

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MR. H. V. CHASNEY, sales representative of H. J. Heinz Co., with his headquarters at Truro, in Cornwall, has been given a dinner in his honour at the Duke of Cornwall Hotel, Plymouth, to mark his retirement after 46 years' service.

Mr. Chasney is the last member of the H. J. Heinz sales force to have met the original Mr. Henry J. Heinz.

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MR. D. C. M. SALT, director of sales, has been appointed alternate to Mr. J. W. Urban on the board of Monsanto Chemicals, Ltd. Mr. Salt, who joined Monsanto in 1935, has a wide experience and knowledge of the company's selling operations. He was appointed general manager of sales in 1956 and, prior to his recent appointment, was general manager of chemicals division.

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MR. D. PERRY, B.SC., has succeeded MR. D. CLARKE as deputy factory manager at the Stork Margarine Works, Bromborough, of Van den Berghs and Jurgens, Ltd. Mr. Clarke has been appointed managing director of Lever Brothers (Nigeria), Ltd.

For some years Mr. Perry has been development manager at Price's (Bromborough), Ltd., before which he was with the Unilever research division for seven years.

Mr. R. J. Bell

Mr R. J. B. McCarthy

Four new directors have been appointed to the board of Brown and Polson (Sales), Ltd.: MR. R. J. B. MCCARTHY is director of the Starch Group, concerned with sales of starches, roll-dried products, dextrines, adhesives, animal feedingstuffs, etc.; MR. W. G. REDLEY is director of the Refinery Group, concerned with sales of all glucose and sugar products; MR. P. CRAVEN is director of the Package Group, responsible for sales of all Brown and Polson products to the grocery, pharmaceutical and allied trades; and MR. F. WOOD, B.SC., A.R.I.C., A.M.I.CHEM.E., is director of a new Technical Service Group.

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MR. M. W. RICHARDS has been appointed a director of the Tiger Oats and National Milling Co. in the place of Mr. T. P. Stratton.

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MR. E. J. ROLFE has been appointed chief technologist to Mac Fisheries, Ltd. In a newly created position he will be responsible for quality control and product development.

Before joining Mac Fisheries, Mr. Rolfe was for 5 years head of a Ministry of Agriculture, Fisheries and Food experimental group dealing with dehydration of animal products, microbiology and packaging research. It was during this period that he evolved the accelerated freeze drying process, an important discovery which shows promise of being a commercial success.

From 1948-1951, he was employed in the victualling department of the Admiralty and before that was on the staff of the Kent County Analyst.

Mr. Rolfe, who is 38, was educated at Shooters Hill grammar school and London University where he read chemistry and pure mathematics for his B.SC.

MR. DEREK NUNN has been appointed to the newly created position of marketing director of Mac Fisheries, Ltd. The appointment has been made as part of the company's expansion programme. He will be responsible for co-ordinating and control of marketing, research and development activities.

MR. J. THOMPSON has resigned from the board of the Aerated Bread Co., Ltd.

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MR. R. D. CROOK has been appointed secretary of Liebig's Extract of Meat Co. in succession to Mr. J. V. Cooper.

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MR. J. VALENTINE BACKES, A.R.C.S., F.R.I.C., D.I.C., has been appointed a director of MalgaVita (Suppliers), Ltd.

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MR. R. YEOMAN, general manager for the Hodgkinson group of foundries, has been made a director of James Hodgkinson (Salford), Ltd.

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LORD DE LA WARR, P.C., G.B.E., has been appointed by the British Dairy Farmers' Association Council as deputy president during the presidency of H.R.H. Princess Alexandra in 1960.

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MR. G. W. PYATT, sales manager, has been appointed a director of British Soya Products, Ltd. He joined the firm in 1953 as a representative and becames sales manager in 1955.

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MR. B. P. WILLIAMS of Forster's Glass Co., Ltd., retired recently owing to ill-health. Having represented the company in South Wales and the West of England pre-war and until 1953, he was then transferred to Glasgow, where he was responsible for Scottish sales. In 1955, Mr. Williams took charge of the Manchester and West Riding area, where he has now been succeeded by MR. A. G. WILSON, who previously represented Forster's in the Midlands.

Obituary

The death has occurred in Glasgow of MR. DAVID WATT, who took a leading part for many years in the operations of the baking trade in Great Britain. A native of Glasgow, he began his business career with J. K. Smith, Hawkhill Bakery, Edinburgh, in 1929, and was assistant general manager of the firm in 1935 when it was taken over by Allied Bakeries. He remained in that capacity until 1946, when he took over the management of the group's bakeries in the London area. He returned to Glasgow several years later as managing director of Welma Bakeries, Ltd.

Mr. Watt had been a member of the major national committees associated with the trade and was chairman of the Federation of Wholesale and Multiple Bakers of Great Britain and Northern Ireland.

MR. S. J. VAN DEN BERGH has been reappointed to the board of Unilever, Ltd. He had previously relinquished his directorships of Unilever companies when he was appointed Dutch Minister of Defence last May, a position from which he recently resigned.

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DR. H. R. BARNELL, M.A., PH.D., B.SC., M.I.BIOL., has been appointed as the Ministry's Chief Scientific Adviser (Food). He succeeds Dr. Norman Wright who joined the Food and Agriculture Organisation of the United Nations in February, 1959.

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MR. PETER TAYLOR has been appointed sales promotion and advertising manager of the Prestcold Division of the Pressed Steel Co., Ltd., in succession to Mr. John Lampson.

Mr. Taylor for 2 years prior to his appointment was advertising executive for the Prestcold Division.

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MR. S. FLOWER has been appointed as marketing manager for the frozen foods division of Smedley's, Ltd. He was previously northern divisional manager for canned goods and his new appointment has led to the promotion to northern divisional manager of MR. J. LEE, who was formerly northern district manager for frozen foods.

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MR. T. J. P. ROBERTS, formerly divisional manager in Birmingham of T. Wall and Sons (Ice Cream), Ltd., has been appointed sales director.

MR. D. M. BARCLAY, who was formerly the sales director, has accepted an appointment as managing director of an ice cream business in Australia recently purchased by Unilever.

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MR. J. M. CHURCHMAN who previously covered the Midland area has been promoted to senior sales executive of Soag Machinery Co. and is assisted by MR. D. M. ENRIGHT and MR. J. W. LAWRENCE.

Their address is: 44, Haughton Road, Handsworth, Birmingham 20. Tel.: Birchfield 5706.

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LORD HEYWORTH, chairman of Unilever, Ltd., and vice-chairman of Unilever, N.V., is to retire from the boards of both companies at their annual meetings which will probably be held in April next year. As Geoffrey Heyworth, he joined Lever Brothers in 1912 and was made a director in 1931. The merger with Unilever took place in 1937 and in 1942 he became chairman of Unilever and Lever Brothers (Unilever since 1952).

When President Eisenhower stayed at Winfield House, Regents Park, London, the residence of the American ambassador, he was presented with an English Stilton cheese on behalf of the English Country Cheese Council. The picture shows Mrs. N. A. Stone, member of the Council with the cheese.

MR. WALTER ZUBER, has been appointed as overseas sales representative for Quickfit and Quartz, Ltd. He will be responsible to Mr. E. L. Harrison, Quickfit and Quartz's sales director. Mr. Zuber graduated in glass technology at Sheffield University.

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The following have been elected as officers of the Association of Public Analysts: president, MR. J. G. SHERRATT; vice-president, DR. J. H. HAMENCE; past presidents, MR. E. VOELCKER, MR. F. C. BULLOCK and MR. H. E. MONK; hon. treasurer, MR. R. C. SPALDING; hon. editor, DR. E. C. WOOD; hon. sec., MR. F. A. LYNE; and asst. hon. sec., MR. D. F. H. BUTTON.

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MR. JOHN DOLPHIN is to become joint managing director of Lansing Bagnall, Ltd., on December 1. He will be concerned with the engineering side of the business which covers the manufacture of fork trucks, materials handling equipment and power gardening tools.

At the moment he is engineer in chief of the research group of the U.K. Atomic Energy Authority.

On the same day, MR. V. A. G. LAMBERT, a director of the main subsidiary, J. E. Shay, will become chairman and joint managing director of Lansing Bagnall.

MR. PETER BOULTON, general manager, will become a director at the same time.

OBITER DICTA

● Frankfurters, fresh daily from Vienna.—*Notice in Golders Green delicatessen.*

● Half of the (U.S.) nation's dogs have kidney trouble caused by eating the food of rich people not fit for a dog.—*Veterinary surgeon in Time.*

● The manufacturing process (for chocolate) followed the customary pattern of selection, roasting, winnowing, grinding, refining and couching.—*Chemistry and Industry.*

● I was born of a vintage which has not been considered worthy of mention in the annals of viniculture.—*Alfred Langebach, celebrating his diamond jubilee in wine trade.*

● Anyone who expected any sort of excitement from Venice's 22nd International Festival of Contemporary Music has been disappointed so far. What has been offered has all the impact of a plate of cold ravioli.—*Daily Express.*

● When I was in Russia before the war, one hotel in Baku had a large notice which read: "Do not tip the waiter—it would humiliate him." I noticed, however, that they all lined up to be humiliated.—*Letter in Daily Telegraph.*

● During the war the State prescribed a standard jam as "legal tender" against coupons. I think it was labelled Full Fruit Standard, and to my unfair recollection it seemed composed of pulp laced with mangelwurzel and synthetic juice.—*George Schwartz, Sunday Times.*

● The appearance of the expression "oven-baked bread" in your columns provokes me to ask whether this, together with "garden peas," "dairy cream," "farm eggs," and all other such phrases, should not forthwith be abolished from our vocabulary.—*Letter in Daily Telegraph.*

● Centuries before iron was smelted at Rievaulx, the monks were carrying out an organic chemical reaction, on the value of which most of us will agree: the conversion of certain naturally occurring carbohydrates into a particular monohydrate alcohol, generally acknowledged very pleasant to the senses as well as to the palate.—*Sir Alexander Fleck, chairman of I.C.I., Ltd.*

Food News Overseas

British Guianan cannery

A new company, styled B.G. Preserve and Canning Company, Ltd., is expected to commence operations in the canning of several kinds of local fruits within a year, according to a Government spokesman. It is possible that the processing of coffee will also be undertaken later. The company propose to build a factory on 500 acres of land, to employ over 100 people. The growing of the fruit to supply the factory is expected to provide employment for one thousand families.

Australian tea factory

Construction of a tea factory at an agricultural experimental station in New Guinea has been approved by Australian Minister for Territories, Mr. Hasluck. It will cost nearly £A27,000 to install, and produce tea worth £A16,000 a year. It is stated in New Guinea that if the experiment is successful, it will provide about 10% of Australia's tea needs and will mean valuable savings in overseas funds.

Brig. Cleland, the Administrator, said the potential of the new industry remained to be proved but would be a valuable asset if successful. It would result in an industry worth £A1½ million with 6,000 acres under cultivation and give employment to 10,000 people.

Cheese production figures

The Soviet Union's production of cheese, although still low per person, has increased by 500% since before the Second World War. In the same period world production has gone up by 70%.

The U.S.S.R. production in 1958 has been estimated at 150,000 metric tons, compared with a pre-war average of 25,000 tons. This figure represents only 5% of the combined output of the 30 countries covered in the review of the Bulletin of Agricultural Economics and Statistics which says although consumption per person has more than trebled it is still only 0·7 kg. per year.

Other cheese-producers posted large percentage increases in their production. Denmark has more than trebled its output, reaching a 1958 figure of 107,000 metric tons. Production in the U.S.A. has more than doubled, making it the largest cheese producer with 639,000 tons. Seven Latin-American countries have doubled their cheese output since the pre-war period. Among the countries covered in the review, only Canada and Switzerland show little change in production figures.

Canadian agents

Quickfit and Quartz, Ltd., have signed an agreement with Corning Glassworks of Canada, Ltd., for the distribution of their laboratory glassware throughout Canada.

No restrictions on Kenya coffee?

Kenya coffee producers are unlikely to participate in the proposed Latin American scheme for export restrictions, says Barclays Bank D.C.O. in a message from Nairobi. A draft agreement would involve retaining about 24,000 tons of unsold coffee in East Africa. Kenya producers are confident that they will always be able to sell their total production, and at some premium for quality, no matter how much coffee is released on to world markets.

Colombo plan dairy

Australia recently shipped a complete model dairy including 200 Jersey cattle to South Vietnam. Separators, butter-making machinery and harvesters to reap fodder for the cattle were among the equipment and dairy buildings to have been erected near Saigon.

The dairy is a Colombo Plan gift from Australia to the people of South Vietnam. The Jersey cattle will be the nucleus of a herd which it is hoped will eventually supply milk for the whole of South Vietnam.

Thai meat plant

A modern abbattoir, including a meat processing plant, is to be built in Bangkok at a cost of Baht 40 million, half of which will be provided from the U.S. Development Loan Fund. $750,000 has already been lent to the Livestock Trading Corporation, Ltd., which will have to find the remaining local currency required, and arrange for construction, which it is hoped will start soon. The abbattoir and processing plant should be able to handle 135 head of cattle and 1,300 pigs a day. All parts of animals slaughtered will be processed, either for consumption or for use as fertiliser. The plans also call for extension of Bangkok Municipality's cold storage plant's capacity to 10,000 carcases, at a cost of Baht 500,000. Increased meat exports with benefits to cattle raisers and foreign exchange receipts are expected to accrue.

Persian beet factory

A sugar beet factory together with full processing equipment costing £2½ million altogether is to be constructed in southern Persia by John Brown and the processing equipment is being supplied by A. F. Craig. When completed the factory will be capable of handling 1,500 tons of sugar beet per day.

The factory is scheduled for competion in 1961.

Dominican expansion

The Dominican Republic is to increase its banana exports under a $10 million development programme to be carried out by the Grenada Company. Nearly $1 million will be spent on improvements to a banana puree plant.

A new departure for the company will be a major tomato growing project with a $500,000 plant for tomato products.

A $2 million flour mill will commence operations in the Dominican Republic in January 1960. It will have an initial capacity of 150 tons of flour a day which will be raised to 250 tons. A considerable quantity of grain will be imported and bulk dock loading and unloading installations will be provided. The mill will be 140 ft. high flanked by 10 storage towers with a total capacity of 12,000 tons.

Olive oil supplies up and prices down

For the third year running an acute world shortage of olive oil has been averted and larger crops at somewhat lower prices are expected to be on the market this year. Despite a 1958/59 European harvest of less than 800,000 tons—down 30% from last year—world production is estimated at 1·1 million tons. This estimate exceeded the recent average consumption in the Mediterranean region, which, as the major user, has accounted for about one million tons annually. The European deficit was largely made up by record production of 135,000 tons in Tunisia, nearly treble that of the previous season, and by a Turkish crop reported to be 90,000 tons. Algeria and Morocco also had good harvests.

The sharpest decline in olive oil production in 1958/59 was in Italy where production was down to 264,000 tons as against 400,000 tons in 1957/58. Output was also poorer in Greece and Portugal.

Prospects for the 1959/60 season are good.

Packaging

Plant for packaging film

The Plastics Division of Imperial Chemical Industries, Ltd., is to erect a new plant near Dumfries for the manufacture of *Melinex* polyester film. It will eventually have a capacity of 2,000 tons or more a year.

I.C.I., the sole manufacturers of polyester film in this country, have been making it in small quantities on a pilot plant at Welwyn Garden City, Hertfordshire, since 1954. Although subsequently enlarged, the output of this pilot plant has permitted of little more than market evaluation. The new plant at Dumfries should satisfy all immediate requirements for a film which I.C.I. say possesses crystal clarity, great mechanical and dielectric strength, as well as chemical and heat resistance.

When the new plant is in full production in 1960/61, it will be possible to do without the importation of American and Continental polyester films.

Although more expensive than the usual packaging films, the film differs from them so radically in every property that a very much wider field of application is confidently expected.

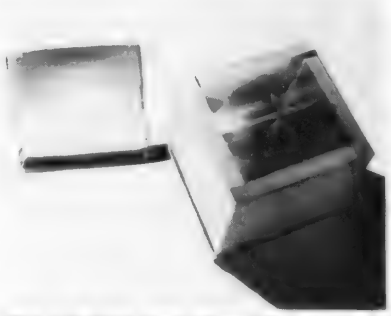
I.C.I. say that *Melinex* has not yet found any really extensive uses in packaging, but when ample supplies are available there is a great potential here for a film with such crystal clarity and sparkle. Window cartons and overwraps are obvious uses, but novel applications may include vacuum-formed containers which can themselves be used for cooking foodstuffs, such as cake mixtures or frozen vegetables. The film has a high melting point and is able to withstand normal cooking temperatures. Dressed poultry packed in a special type of the film may be cooked in the pack so as to preserve all the natural juices of the bird.

Melinex is made from the fibre-forming polymer known as *Terylene*.

Fibreboard outer

Reed Corrugated Cases, Ltd., are now supplying Iridon, Ltd., with a die-cut one-piece corrugated fibreboard case as an outer for their *Cubitainer*, the inner component of which is a semi-rigid polythene container. The latter is produced for carrying a wide range of liquids, powders and semi-solids.

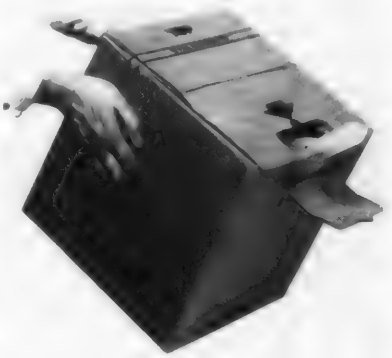
As both the polythene container and the fibreboard case are collapsible, considerable saving in storage space can be made in comparison with traditional types of containers.



This foil-lined board biscuit box made by New Merton Board Mills, Ltd., is claimed to give protection against moisture equal to the conventional biscuit tin.

The rigidity of the corrugated case complements the flexibility of the polythene inner container. The contents are free to surge inside the polythene and the case has to be strong enough to withstand this internal pressure, as well as to carry the weight of the contents and protect them against external shock.

The cases are die-cut to provide a perforated quick-opening release. This enables the spout of the polythene container, which has been heat-sealed after filling and folded into the case, to be pulled out and cut open for pouring. The five gallon size also has perforations at the side which, when pressed in, provide hand-grips for easy handling and pouring.



The 5 gal. Cubitainer for liquids and powders. The double-walled corrugated fibreboard outer supplied by Reed Corrugated Cases, Ltd., is die-cut for quick release of the spout of the polythene inner container. Perforated hand grips are die-cut in the sides for ease of handling.

Canned mineral waters

Benjamin Shaw and Sons, Ltd., believe that they are the first firm in the country to produce a canned carbonated beverage on more than a trial scale.

The drink, called *Suncharm*, has been made available to the firm's customers within their normal delivery area covering most of Yorkshire and Lancashire. Previously it was available in quart and split size bottles.

The can is similar to a 12 fl. oz. beer can but Metal Box Co., Ltd., who make the can, have coated the interior with a special lacquer. The drink retails at 10d.

Steaklet pack

The latest addition to the range of quick frozen foods made by Northern (Frozen Foods), Ltd., is the *Espresso* pack of four beef steaklets, net weight 7 oz. Ready for cooking, they are produced from prime English beef and manufactured by the Hollymatic machine which is said to guarantee uniformity of shape and weight.

The carton, supplied by Pearlite Box Co., Ltd., is constructed of white lined board with collapsible tuck in ends and is high gloss wax coated. Illustrated in four colours, red, blue, brown and yellow, it is thought that this new pack is bound to attract attention and sales.

Foil-lined carton

A new foil-lined board biscuit box, stated to give protection against moisture vapour equal to that of the conventional biscuit tin, has been introduced by New Merton Board Mills, Ltd. It is the latest addition to the company's range of non-returnable biscuit boxes.

The resistance to moisture vapour is obtained by using aluminium foil lined Kraft board. The box is supplied in three parts, comprising a flat folded shell and two flat identical end pieces.

A new machine has been designed by Packaging Machinery Co., Ltd., to preform and heat seal all four corners of these end pieces. The shell is reinforced by 1 in. flanges on each open edge to give vertical and lateral rigidity so that the finished boxes can be stacked to the same height as the conventional tin.

The two end pieces are fitted to the shell by gummed tape using a simple jig, a method which enables the user to form a hinged lid at one end by cutting the tape on three sides. Closing

the lid after use restores the resistance to moisture vapour.

The makers say that not only is the new box cheaper than a tin, but it can also be printed on one or more sides so that the expense of labelling is also eliminated. It is being produced initially in the same size as the standard biscuit tin, but special sizes can be produced to order.

Redesigned can

Smedley's have introduced a newly designed can and a change of name for their best selling line, garden peas.

Now known as Smedley's Garden Fresh Peas, the can has been designed and manufactured by the Metal Box Co., Ltd. Printed straight on to the can, the design is in green with black and red lettering on white. The royal warrant, in three colours, is on a gold background.

Polythene liners

Containers lined with film made of Union Carbide polyethylene, now being used to package fruit juice concentrates, have resulted in a 67% shipping cost reduction over the metal pail method formerly employed, according to a leading juice concentrate producer in the United States.

The concentrates are packaged and shipped in 5 U.S. gal. (18·9 litres) corrugated boxes having disposable film bag liners. Disposable metal pails were formerly used but with the polyethylene-lined boxes, the same volume of juice concentrate can be shipped at ⅓ the cost. Other savings result from the greatly reduced amount of space required by the film-lined package in storage and in transit.

The use of 0·003 in. thick, pinhole-free polyethylene film allows for lightweight, leakproof containers, according to the concentrate producer. Sealing of the polyethylene liner is a simple matter—the liner is gathered at the top, twisted and bound with a piece of paper-covered wire.

Frozen food pack

After two years' intensive research, food technologists of J. Lyons and Co., Ltd., claim that they are opening up a new future for frozen foods in British catering. Working closely with other experts, they have developed a pack for ready-cooked frozen food which, they claim, makes for tastier, quicker and easier-to-heat meals.

Instead of conventional containers, the food goes into special vacuum-sealed plastics packs which are heated by boiling and opened with scissors. The packs are made by the Cascelloid Division of British Xylonite, Ltd.

Lyons say that the new packs mark an advance in catering because they: seal in the flavour of the food, from packing to serving; cut heating time to 15 min., half that needed for comparable frozen foods; and provide for heating different meals in the same saucepan at the same time.

Polythene containers of French mustard of this pattern are filled by Evans Chemicals, Ltd.

Called *Flavour Seal*, the new packs are being marketed by Lyons "Frood" Division. They are filled on new machinery at Cadby Hall.

Three lines are available, all in one-portion packs: spring stew—diced mutton in a meat sauce, garnished with haricot beans, peas and carrots; braised steak with vegetables—braised beef, garnished with haricot beans, peas and carrots; and stewed steak and onions.

Fish cake cartons

Regent Foods, Ltd., have introduced a new fish cake carton as a partner to their *Chicklette* pack introduced last May. The pack is printed in a combination of pale blue, navy and magenta.

Each carton contains two fish cakes so that the housewife will now be able to buy individually packed quick frozen fish cakes in place of the former larger pack which held six.

This Venesta aluminium foil wrap is claimed to be the first of its kind to be adopted for plain ice-cream, and comprises 0.009 mm. aluminium foil laminated to 13½ lb. double crown tissue, and is supplied in reels 5⅞ in. wide.

Mustard packs

Evans Chemicals, Ltd., are now packing French mustard into sausage shaped containers for Hax, Ltd. The mustard, called *Hot-a-Dog*, is shipped over in bulk in barrels from Dijon and, using special machinery, filled direct into 2 fl. oz. capacity polythene containers.

A white plastic display tray, which holds 6 sausages together with a display card printed in yellow and white on black. is being used as a sales aid.

Beer cups

Waxed paper beer cups, known as *Lily* cups and intended for once-only use, are now being made in large quantities in this country by Lily Cups and Containers (England), Ltd. The cups do not carry the Imperial Measure stamp but are said to be ideal for bottled or canned beer, the size, 12 oz., taking the contents of a ½ pt. beer bottle.

The cups have a special coating which is quite odourless and tasteless and preserves the head of the beer. According to the makers this gives the cups a coating which is to all intents and purposes the equal of a perfectly clean glass.

Display outers

Four new display outers for the ½ lb. packs of *Atora* shredded suet have been designed by Richard Lonsdale-Hands Associates for Hugon and Co., Ltd. They are made by Reed Cartons, Ltd.

Each carries on the back panel a full colour illustration of a dish made better with "Atora" and the use of a background pattern of open check associates each dish with a laid table. The colour of the check is different on each outer, being pink, grey, yellow or pale blue, and the familiar "Atora" pack is illustrated on the front and side panels.

The four designs will be issued as an assortment, so that one case of suet may include up to four different display outers.

Coffee pack

R. Twining and Co., Ltd., are now selling their *Caterers' Coffee* in a *Metathene* pouch containing sufficient coffee for a ½ gal. brew. This new pack is made of *Metathene* D420 printed in blue, white and brown, and is produced by the Plastics Group of the Metal Box Co., Ltd.

The low gas transmission of *Metathene* polythene coated cellulose film is said to make it particularly suitable for packaging coffee, which reaches the caterer in roaster-fresh condition. For this pack, printed *Metathene* is supplied in reels for fully automatic forming, filling and sealing on a Hansella machine.

Trade Marks

GREEN LEAF. — 781,639. Canned oranges, canned meat and canned poultry. **Zhong Guo Shipin Chukou Guangsi (China National Foodstuffs Export Corporation),** 38, Chiao Tze Hutung, Kuang An Men Street, Peking, China.

POTALUX.—781,051. All goods included in Class 29. **Ernest Alfred Tooley,** 20, Fenchurch Street, London, E.C.4.

GREATWALL.—781,640. All goods included in Class 29. **Zhong Guo Shipin Chukou Guangsi (China National Foodstuffs Export Corporation),** 38, Chiao Tze Hutung, Kuang An Men Street, Peking, China.

SURF KING.—781,944. Canned salmon. **George Richard Cole** and **George Leonard Cole** trading as **G. R. Cole and Co.,** 28, Martin Lane, Cannon Street, London, E.C.4.

VATEL.—782,166. Butter, milk, cheese and cream. **Etablissements A. Barthelemy,** 24, rue Auguste Chabrières, Paris, France.

FINOFARE.—B782,891. All goods included in Class 29. **Allied Bakeries, Ltd.,** 40, Berkeley Square, London, W.1.

FRUPORT.—784,530. Fruit and tomatoes, all being canned; and preserved fruit and frozen fruit. **Fruport, Ltd.,** 42, Westleigh Road, Putney, S.W.15.

COLAN-PAK.—787,203. Poultry (not live). **Herbert James Strudwick** and **Sylvia Joyce Strudwick** trading as **Baylis Fisheries,** 13, Baylis Parade, Stoke Poges Lane, Slough, Bucks.

WISSOLL—FOUR IN ONE.—775,439. All goods included in Class 30. **Karl Schmitz** and **Elisabeth Schmitz** and **Wissoll G.m.b.H.** and **Tengelmann G.m.b.H.,** trading in co-partnership as **Firma Wilh. Schmitz-Scholl,** Wissollstrasse 5-19, Mulheim/Ruhr, Germany.

FINOFARE.—B782,888. All goods included in Class 30. **Allied Bakeries, Ltd.,** 40, Berkeley Square, London, W.1.

TUSTEE FREEZ.—782,931. Ice cream, ice cream confections, mixtures for making ice cream and water ices. **Tastee Freez International, Ltd.,** 350, King Street, London, W.6.

LT'L GEEZER.—785,563. Non-medicated sugar confectionery being sweets. **Primrose Confectionery Co., Ltd.,** Argyll Avenue, Trading Estate, Slough, Bucks.

TARTAN.—787,267. Tea. **Melroses, Ltd.,** 51-57, Couper Street, Leith, Edinburgh, 6.

Trade Marks— — — —

DESERT SPRING.—785,874. Canned fruit. **Guthrie and Co., Ltd.,** Battery Road, Singapore, and 52-54, Grace Street, London, E.C.3.

MORNING CATCH.—786,787. Canned fish. **David Taylor and Son, Ltd.,** Eastcheap, London, E.C.3.

CABER.—778,572. All goods included in Class 30, but not including rock or any goods of the same description as rock. **Minsterley Creameries, Ltd.,** Minsterley, Shrops.

HUMECTOSE.—782,091. Liquid glucose (for food). **Tunnel Glucose Refineries, Ltd.,** Thames Bank House, Tunnel Avenue, Greenwich, London, S.E.10.

FRY'S MEDLEY.—784,614. Chocolate, chocolates and non-medicated confectionery. **J. S. Fry and Sons, Ltd.,** Somerdale, Bristol.

TOYFAIR.—785,044. Biscuits (other than biscuits for animals). **Chiltonian, Ltd.,** Manor Lane, Lee, London, S.E.12.

KEMP'S BERKELEY SQUARES.—786,182. Biscuits (other than biscuits for animals), for sale in Great Britain. **Scribbans-Kemp (Bakeries), Ltd.,** 1,000, North Circular Road, Cricklewood, London, N.W.2.

SOUTHERN CHOICE.—786,538. All goods included in Class 30. **J. Gerber and Co., Ltd.,** St. George's House, 193-197, Regent Street, London, W.1.

FRUIT-O-MELS.—786,536. Non-medicated fruit-flavoured confectionery. **Clarnico, Ltd.,** The Confectionery Works, Waterden Road, London, E.15.

STELCO.—784,519. Canned meats. **Sheed Thomson and Co., Ltd.,** Hibernia Chambers, London Bridge, London, S.E.1.

FAIRLAND.—785,767. Canned meat, canned fruits, and canned vegetables. **Isaac Modiano, Brother and Sons, Ltd.,** 5, Lloyds Avenue, London, E.C.3.

SEA CARNIVAL.—786,681. Canned fish. **Balkwill and Storey, Ltd.,** 136-137, Upper Thames Street, London, E.C.4.

PASTRINE.—787,343. Edible oils and edible fats. **J. Bibby and Sons, Ltd.,** 21, King Edward Street, Liverpool.

MOTHERS JOY.—B780,848. All goods included in Class 30. **W. J. Brookes and Sons, Ltd.,** Skerton Road, Old Trafford, Manchester, 16.

Boomerang Confectionery, Ltd., Victoria

COBBER.—784,347, and **KOALA.**—784,349. Sweets, being non-medicated sugar confectionery and sweet biscuits. House, London, W.C.1.

ELIZABETH SHAW SUPREME ASSORTMENT.—782,895. Non-medicated confectionery. **Elizabeth Shaw, Ltd.,** Norfolk House, 28, Norfolk Street, London, W.C.2.

DOTTO.—B786,286. Biscuits (other than biscuits for animals). **William MacDonald and Sons (Biscuits), Ltd.,** Glengarry Biscuit Bakery, Earl Haig Road, Hillington, Glasgow, S.W.2.

VAROPA.—786,737. All goods included in Class 30. **Van Rooij-Paijmans N.V.,** Oude Lind 33, Tilburg, Holland.

SNIPIT.—787,726. Condiments. **Hax, Ltd.,** Lion House, Red Lion Street, London, W.C.1.

ZEST.—B779,079. Tinned foodstuffs for dogs. **Warrington Canners, Ltd.,** Riverside Works, Warrington, Lancs.

DIABENA.—780,009. Non-alcoholic beverages included in Class 32. **Elmag,** Kirchstrasse 2, Glarus, Switzerland.

CASCADE.—787,403. **L. Rose and Co., Ltd.,** 11, Grosvenor Road, St. Albans, Herts.

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308, Euston Road
London, N.W.1.
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New Companies

T. T. Bonner, Ltd. (633796.) 55-57, Onslow Road, Southampton. Confectioners, chocolate and sweet mnfrs., bakers, etc. £100. Subs.: Marion Simmons and Janet Buckfield.

Colborn Vitafeeds, Ltd. (632052.) To carry on the bus. of mnfrs. of and dlrs. in cattle foods, etc. £12,000. Subs.: E. H. Wiseman, 8, Severn Avenue, Gidea Park, Romford, and J. Mills.

Colborn Vitafeeds (Sales), Ltd. (632053.) £100. Subs.: E. O. Davis, 107, Culver Grove, Stanmore, Mdx., and J. Mills.

B. Collier, Ltd. (634295.) 4, Crofton Avenue, Sheffield 6. Bakers, confectioners, caterers, pastrycooks, etc. £1,500. Dirs.: Mary K. Collier, Mrs. Barbara C. Crookes and Mrs. Katherine Johnson.

W. Degener, Ltd. (632076.) To carry on the bus. of bakers, confectioners, pastrycooks, etc. £1,000. Dirs.: W. and Eve Degener. Subs.: G. A. Crook, 51, Caversham Avenue, London, N.13., and Emily Faulkner.

Essay Smoked Salmon, Ltd. (634313.) 9-12, Basinghall Street, London, E.C.2. Smoked salmon curers, etc. Subs.: K. H. Port and I. B. Loochin.

Evercold Aerated Drinks, Ltd. (634237.) 53, Eastcheap, London, E.C.3. Mnfrs. of and dlrs. in automatic vending machines and machines enabling the automatic supply of edible or liquid products, etc. Dirs.: D. N. Morphew and Brig. F. C. H. Scott.

Norwegian Canners Association, Ltd. (630786.) To promote and further the interests of the Norwegian Canning Industry in the U.K., etc. Company limited by guarantee without share capital. Subs.: Cyril V. A. Artes, 84, Greenway, London, N.14, and John W. Sharman.

Alfred Porter (Service), Ltd. (630022.) Stella Works, Stanley Road, Teddington. Repairers, mnfrs. and assemblers of refrigeration and ice cream machinery, etc. £2,000. Dirs.: G. F. Crook and H. T. Jacobs.

B. E. and L. E. Shaw, Ltd. (630932.) 22, George Street, Croydon, Surrey. Mnfrs. and preservers of and dlrs. in honey and allied commodities, jams, etc. £5,000. Dirs.: Brian E. and Lionel E. Shaw.

Stardust Confectionery Co., Ltd. (631112.) Newton Street, Blackburn. £35,000. Dirs.: Maurice, Isaac H. and Harvey Specter, and Maurice J. Horne.

Thomas E. Taylor (Holdings), Ltd. (630398.) River Street, Bolton. To take over the bus. of bakers' sundries specialists cd. on by Thomas E. Taylor, Ltd. (incorporated in 1912). £2,000. Dirs.: Harry and Violet A. Blackburn.

Turret Chocolates (Liqueurs), Ltd. (630549.) Turret House, Palmerston Street, Bollington, Ches. £5,000. Dirs.: Joseph, Gladys and Bryan J. V. Hadfield.

Weymouth Creameries, Ltd. (630449.) 21, Manchester Square, London, W.1. To carry on the bus. of purchasing, for mnfre. into milk products, or selling by retail, liquid milk, etc. £2,000. Dirs.: Malcolm J. and Margaret N. Vaux.

These particulars of new companies recently registered have been extracted from the daily register of Jordan and Sons, Ltd., Company Registration Agents, 116, Chancery Lane, London, W.C.2.

Recent Patents

COMPLETE SPECIFICATIONS ACCEPTED

818,003. E. W. ROLLINSON (GERBER PRODUCTS CO.): Egg food product.
818,175. SWIFT AND CO.: Process of treating meat.
818,341. F. UHDE, G.M.B.H.: Process for recovering sugar from sugar-containing substances.
818,364. NEWTON, CHAMBERS AND CO., LTD.: Apparatus for dispensing pastes, creams and liquids.
818,675. BIOCHEMIE, G.M.B.H.: Animal feed supplements.
818,707. W. MEADOWCROFT AND SON, LTD.: Bottle filling apparatus.
818,892. BAKER PERKINS, LTD.: Bread loaf conveying means.
818,940. GOODYEAR TYRE AND RUBBER CO.: Rubber hydrochloride film for packaging prunes and the like.
819,007. M. CLAUSSE: Bread-rolling machines.
819,078. GENERAL FOODS CORPORATION: Chiffon dessert preparation.
820, 987. P. P. WEINER: Process for preserving hops.
820,995. UNILEVER, LTD.: Fat compositions.
821,269. FARBENFABRIKEN BAYER A.G.: Animal feed.
821,361. W. BRIERLEY, COLLIER AND HARTLEY, LTD.: Machines for topping and tailing onions, shallots and other vegetables
821,369. H. BECKMAN: Process and apparatus for conserving and cooling foods.
821,371. L. B. DARRAH: Shell-less egg, method and means for marketing same
821,471. T. AND T. VICARS, LTD., and J. F. NAYLOR: Dough-sheeting machine.
821,493. S. J. POPEIL: Food chopper.
821,545. T. AND T. VICARS, LTD.: Bakery conveyor systems.
821,761. F. GROSSMAN: Production of cereal flours and meals.
821,906. W. R. GRACE AND CO., LTD.: Method of making a food package.
821,995. B. H. KATETEN: Method of preparing food products in particle form.
822,018. NIBBIT PRODUCTS ASSOCIATION, LTD.: Method of preparing a foodstuff.

ABSTRACTS OF BRITISH PATENTS

Dehydrated orange juice

Dehydrated orange juice, which upon reconstitution has substantially the same flavour as the original juice, is prepared by raising the temperature of an orange juice concentrate to 140-155°F. and simultaneously reducing the pressure as rapidly as possible to about 5/16" of mercury, maintaining the product under these conditions until it is thoroughly puffed, reducing the temperature of this puffed product to room temperature whilst maintaining the vacuum, and finally grinding the cooled product.

In an example, the concentrate contained 50-60% solids and, after heating to 90°F., it was mixed with corn syrup solids at the rate of 10 parts of concentrate to 4 parts of corn syrup solids; by reducing the pulp content in this manner, the concentrate puffs more readily. Sodium sulphite was then added as a colour preservative. After deaerating at 240°F. under reduced pressure, the temperature was dropped in two stages to below 155°F. and the product was then puffed. After cooling, the product was crushed to a fineness at which 100% passed through a 10-mesh screen, and then mixed with 1% of a mixture of 5% orange oil and 95% sorbitol. Finally, the product was packed under moisture-proof conditions.—815,354. *Vacu-Dry Co.*

Milk concentrate

Claims a powdered fat-containing milk concentrate which readily disperses, even after storage, in water to form a smooth, non-settling and stable dispersion. The concentrates, which comprise 35-88% non-fat milk solids and 12-65% fat, can be prepared by adding a milk-coagulating enzyme, such as rennet or papain, to a fluid fat-containing milk composition having a solids content of 5-70%, preferably 45%, and a fat content of 12-65% (dry basis); the resultant mixture is maintained at the enzyme active temperature and is rapidly heated to inactivate the enzyme after the viscosity, which at first decreases, has increased to at least its initial value.

The fluid fat-containing milk composition may be whole milk, a flavoured milk beverage or dried cream, but, in the last case, the dried material must be dispersed in water prior to the enzyme treatment.—814,924. *American Home Products Corp.*

Preserving proteinaceous foodstuffs

In hot, humid, tropical regions, proteinaceous foodstuffs, such as meat and fish, are generally preserved by rather primitive methods such as drying in the sun, in the case of fish after a preliminary salting. These products usually have a very limited storage life and soon develop unpleasant odours. The efficiency of the preservation appears to depend on the water content of the treated material and, by the known methods, it is difficult to obtain a satisfactory and uniform moisture content throughout the product.

It has been found that by mixing the natural undried product in small pieces with 40% to 85% by weight of an amylaceous material, such as a starch-containing flour, for example, manioc flour, the resulting mixture can easily be dried to a moisture content of 10-15%. The final product is perfectly preserved and can be used as a concentrate for tasty soups and other dishes.

In an example, the manioc flour is pre-dried prior to use. With certain fish, such as herring, the fish oil may be separated by treating the fish with warm air for several minutes. Finally, a short pre-heating serves to assist the easy recovery of the skin which can be used for glue manufacture.—815,465. *F. E. de Vries.*

Abstracts of British patents have been taken from published specifications by permission of the Controller, H.M. Stationery Offices. The full specifications are available from: The Patent Office, 26, Southampton Buildings, London, W.C.2. Price 3s. 6d.

Technical Press Review

October

World Crops.—Tenth Anniversary Issue: Looking Forward; Agricultural Mechanisation: The Machine in Tropical Agriculture—II; Subsoiling.

Dairy Engineering.—High Temperature Treatment of Milk; Control of Cheesemaking by Physical Methods; Improving the Shelf Life of Milk and Milk Products; Preview of the Dairy Show; Bulk Handling: The Modern Method of Milk Handling; Progress in Scotland.

Manufacturing Chemist. — Perfumery and Cosmetic Materials: Review of Perfumery and Cosmetic Materials; New Raw Materials for Perfumery and Cosmetics; Givaudan's British Factory; Lemongrass Oil from Ceylon; Progress Reports: Perfumery and Essential Oils; Cosmetic and Toilet Preparations; Pest Control Chemicals.

Fibres and Plastics. — Flammability of Fabrics; Lined Fire Hose in Sweden; Fibres and Plastics for Fire Fighting; Circular Loom for Hoses; New High-strength Yarn for Tyre Cords; Work Study in a Hosiery Mill; Place of Research in Textile Management.

Paint Manufacture.—Printing Ink Progress; PATRA'S Printing Ink Research; An Evaluation of Zirconium Driers; Driers for Decorative Gloss Paints.

Chemical and Process Engineering.—Project Engineering; Design and Organisation of a Chemical Project; Project Organisation—the Client's Point of View; The Technology of Zirconium and Its Alloys —2; Chinese Progress in Atomic Science; Ion Exchange; Hypo from By-product Sulphite.

For specimen copies write to Leonard Hill House, Eden Street, London, N.W.2.

Number 14 October 1959

The Examination of Edible Oils & Fats (No. 1)

LODERS and NUCOLINE LTD.

INFORMATION BULLETIN

This advertisement is one of a series of Information Bulletins issued by Loders & Nucoline Ltd. Copies are available, together with a folder, on request to Loders & Nucoline Ltd., Unilever House, London, E.C.4.

The following series of Bulletins which we have grouped under the heading of 'The Examination of Oils and Fats', consist of a description of the tests used in our laboratories for the quality control of our products, (a) *to detect adulteration in natural oils and fats, and* (b) *to maintain agreed specifications in respect of specialised products.*

SAPONIFICATION VALUE

Definition : The number of milligrams of potassium hydroxide (potash) required to saponify 1 gram of oil or fat.

The results of this test are indicative of the nature of the combined fatty acids present, e.g. values above 200 indicate the presence of fatty acids of low or fairly low molecular weight, and values below 190 indicate the presence of high molecular weight fatty acids. Coconut and Palm Kernel Oils consist of glycerides of fatty acids with low molecular weights and hence have Saponification Values between 240 and 260. On the other hand, Rape Oil containing large amounts of the high molecular weight fatty acid, Erucic Acid, has an average value of 175.

SAPONIFICATION EQUIVALENT

Definition : The number of grams of oil or fat saponified by one gram—equivalent (56.1 grams) of potassium hydroxide.

The Saponification Equivalent may be calculated from the Saponification Value by substituting in the equation—

$$\text{Sap. Equiv.} = \frac{56100}{\text{Sap. Value}}$$

The Saponification Equivalent is a useful value to have as in the absence of free fatty acids and more than a trace of unsaponifiable matter, it is the mean equivalent weight of the glycerides present, and from it may be calculated the mean molecular weight of the combined fatty acids.

ACID VALUE

Definition : The number of milligrams of potassium hydroxide required to neutralise the free fatty acidity of one gram of oil or fat.

Normally the free acidity is expressed as a percentage of the major fatty acid present, e.g. Coconut and Palm Kernel Oils are expressed in terms of Lauric Acid, molecular weight 200; Palm Oil as Palmitic Acid, molecular weight 256, and liquid oils (Groundnut, Cotton, etc.) as Oleic Acid, molecular weight 282. It is interesting to note that there is evidence to show that the mean molecular weight of the free acids in an oil or fat may differ somewhat from the mean molecular weight of the combined fatty acids.

Acid Values, however expressed, are of value to the refiner of crude oils as indication of the amount of free acid to be removed ; applied to neutral oils they show how well this has been carried out. To users of refined products low Acid Values indicate purity, but better still, if applied to stored products at regular intervals, will indicate deterioration if regular increases occur.

ESTER VALUE

Definition : The number of milligrams of potassium hydroxide required to saponify i.e. hydrolyse the neutral glycerides present in 1 gram of oil or fat.

This value is sometimes applied to crude oils and may be obtained by subtracting the acid value from the saponification value.

REFRACTIVE INDEX

Definition : A measure of the extent to which an oil or liquid fat will bend a beam of light when passing through from air ; it is measured by a refractometer

The Refractive Index is allied to the Iodine Value in that it also indicates the degree of unsaturation, oils of high iodine value having a high refractive index. Owing to the rapidity with which a test may be carried out, it is a useful guide during hydrogenation, but generally it is less informative than iodine value.

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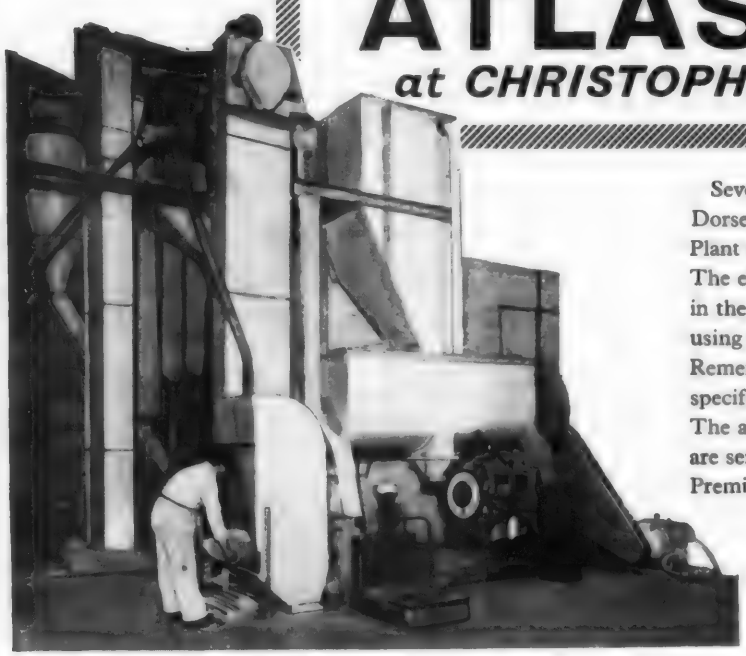

Photograph by courtesy of Christopher Hill Ltd

Several years ago Christopher Hill Ltd., of Poole, Dorset, installed a Porteus Concentrate and Mixing Plant which incorporated a 1 ton ATLAS MIXER. The efficiency of this plant was the deciding factor in the choice of a second plant for Concentrates using a 2 ton ATLAS MIXER.

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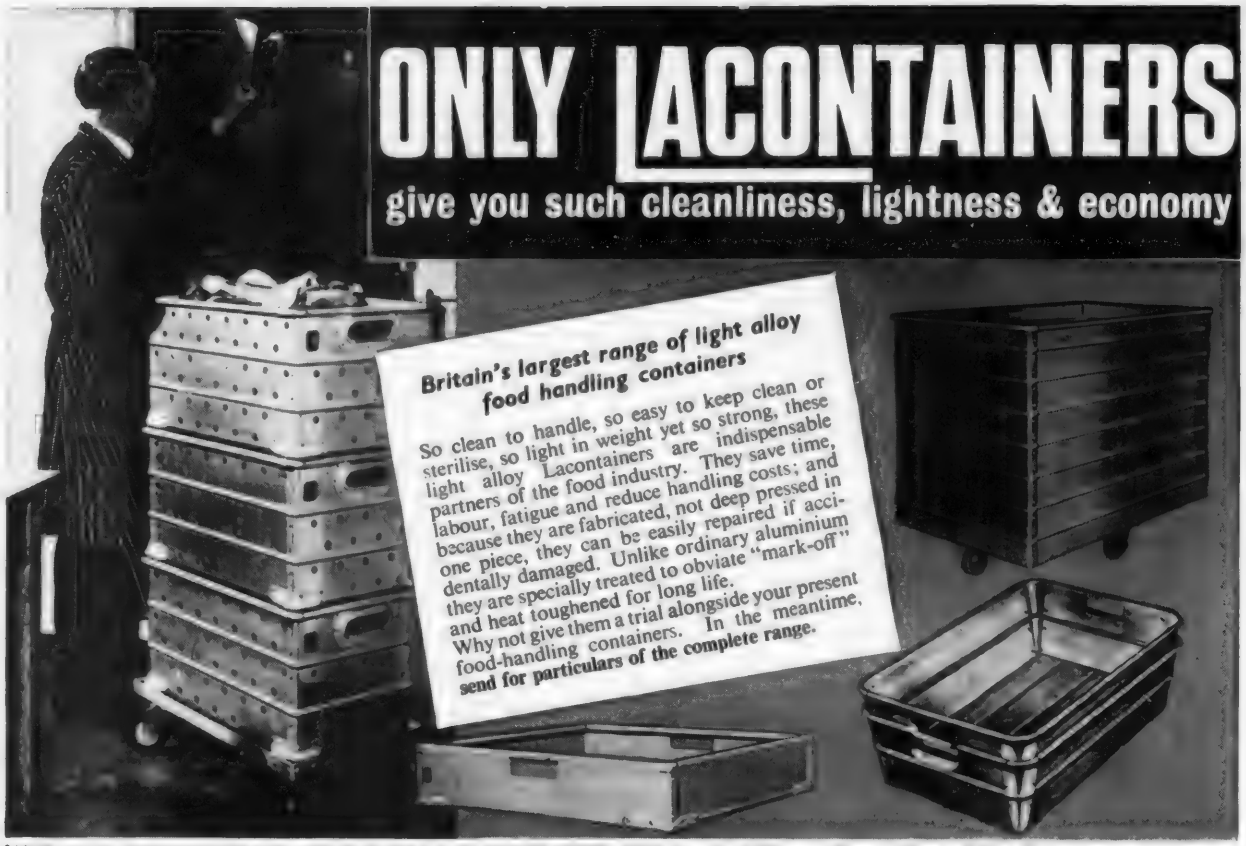

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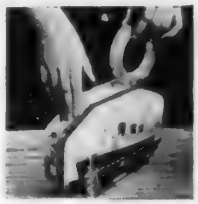

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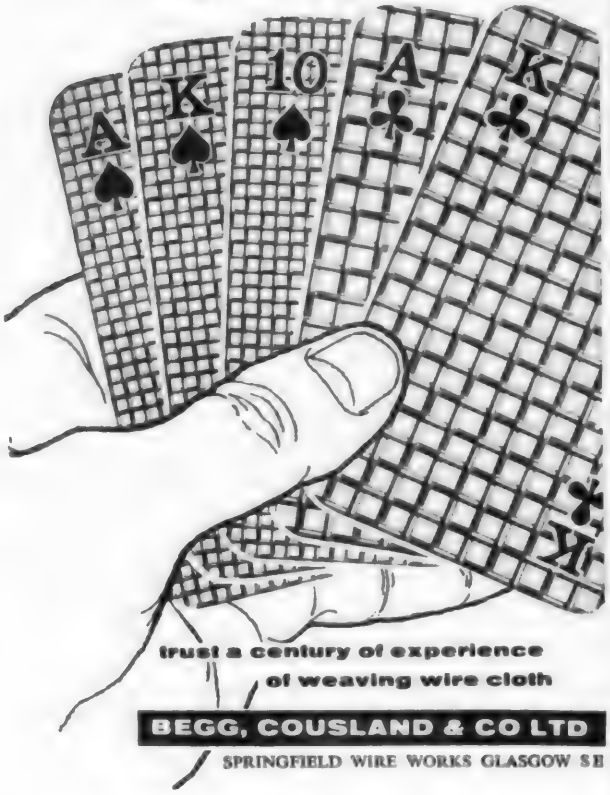

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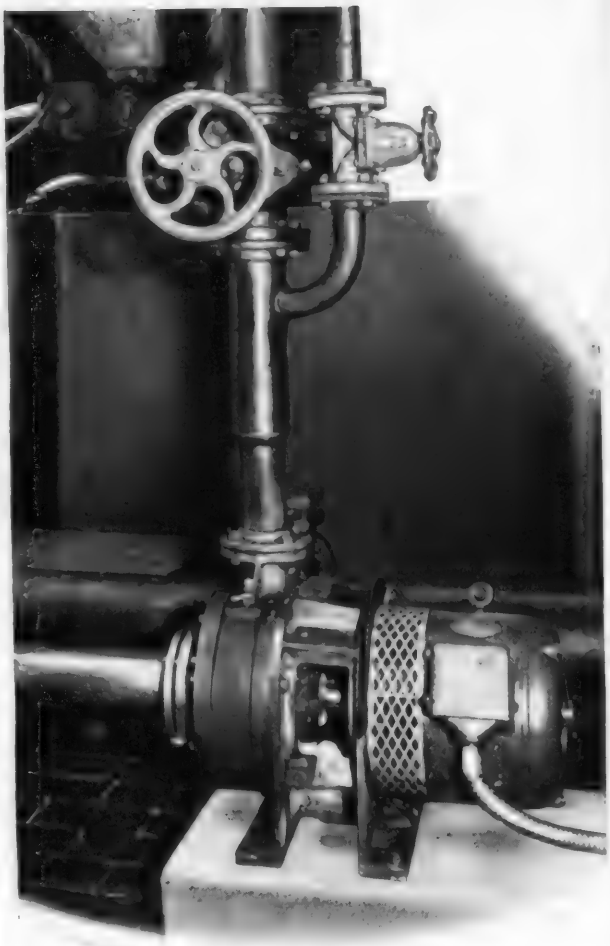

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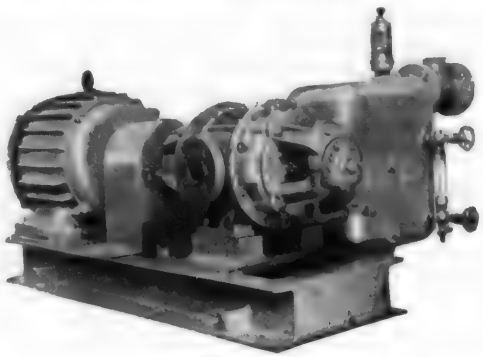

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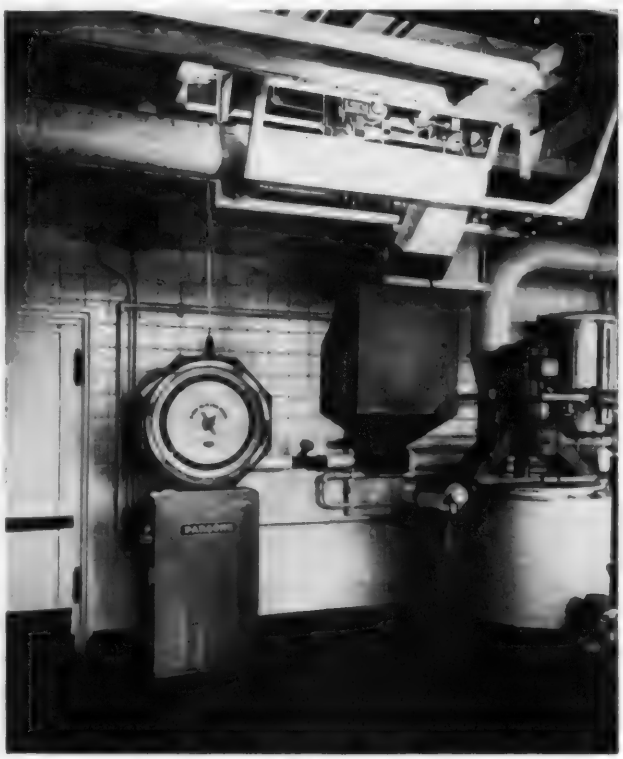

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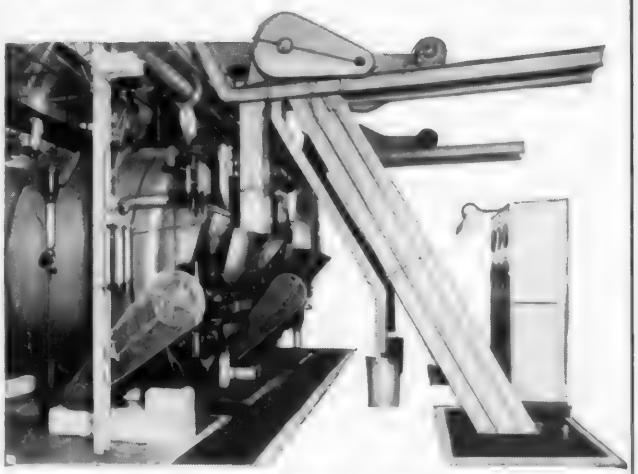

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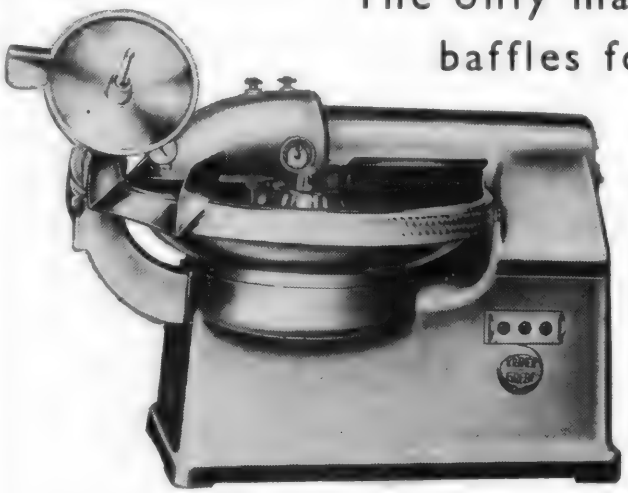

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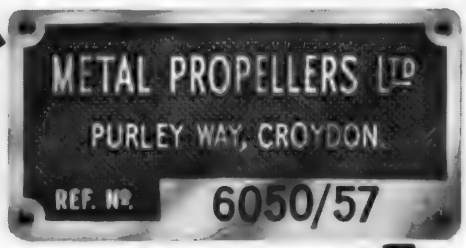

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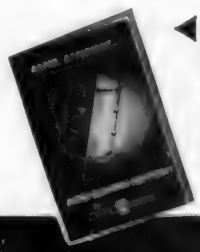

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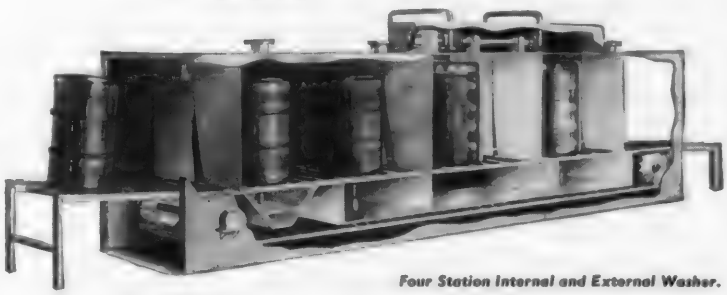

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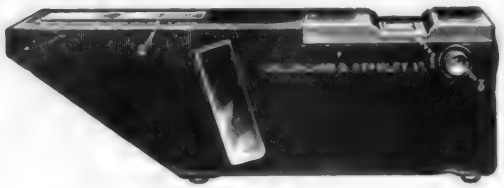

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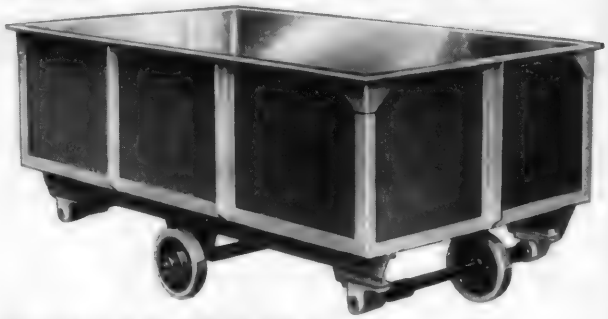

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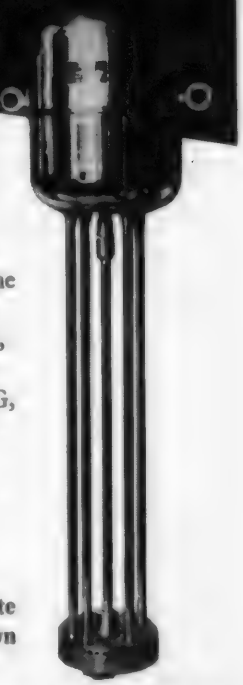

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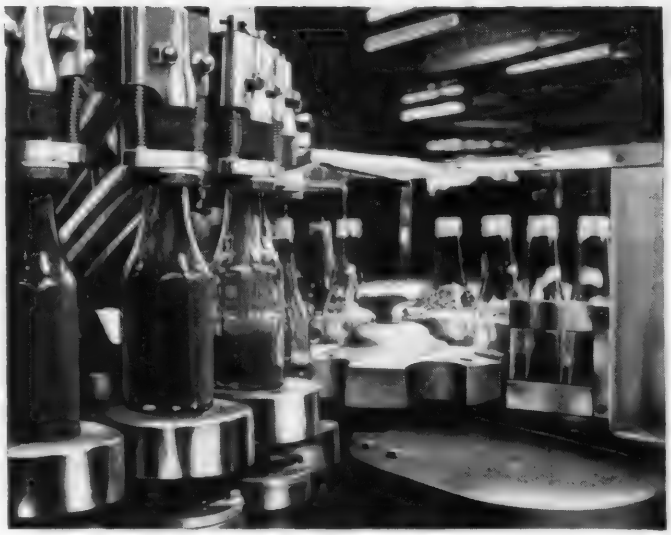

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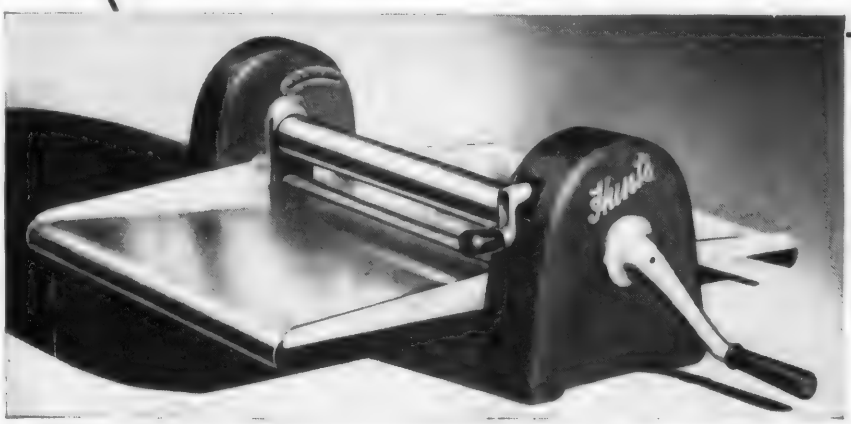

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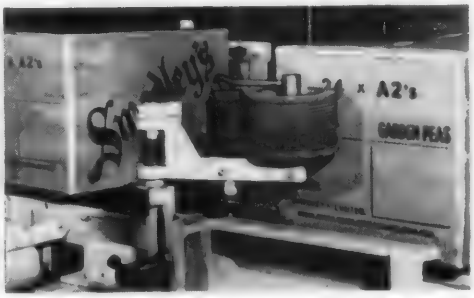

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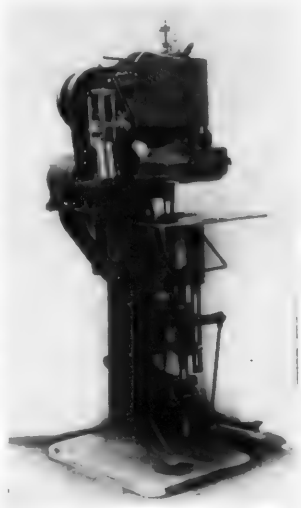

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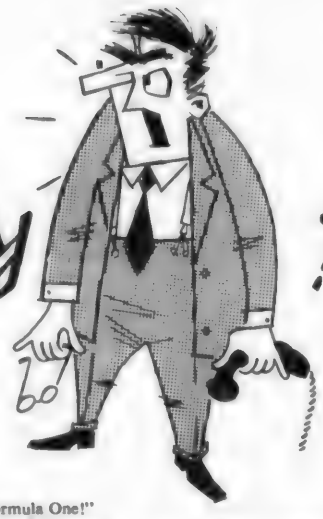

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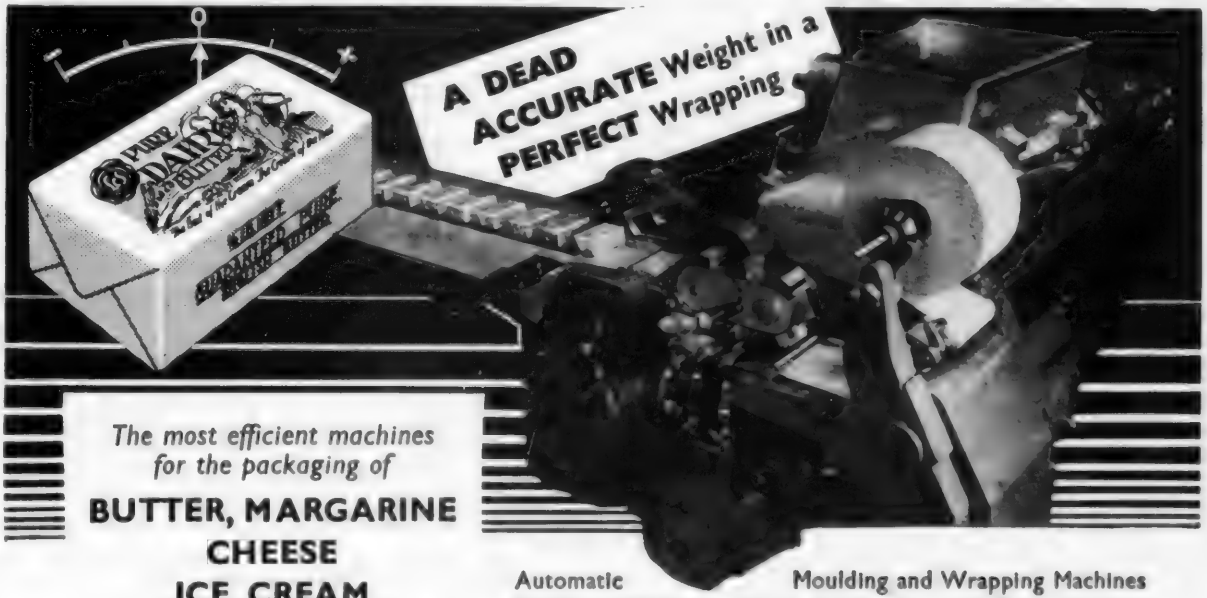

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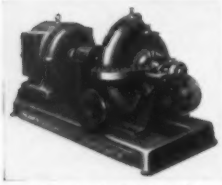

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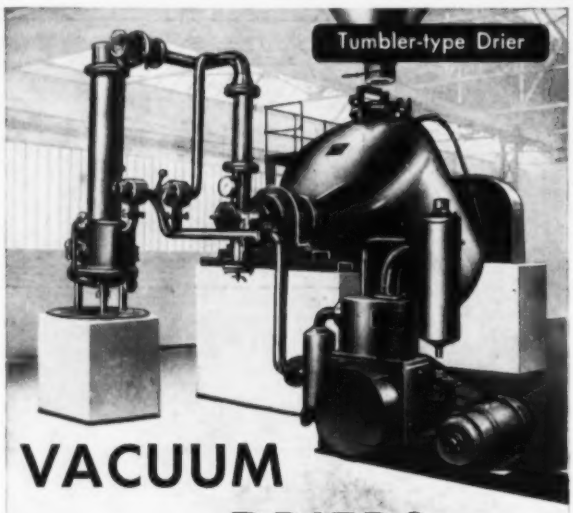

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